

Lab Activity #1

Preparation:

Students should have read chapter 2 of the textbook prior to lab. All students are to take several minutes to independently review the chapter. Lab teams of two to three people will be randomly selected during the lab period.

Procedure:

All written work for this lab activity should be typed directly in to Microsoft Word. Completing the activities is meant to be a **team effort** even though a single individual must take responsibility for making sure the written lab assignment is submitted in good form and on time. Use full sentences and be accurate and descriptive when answering questions.

There will be four different kinds of lab stations set up for this activity. Lab teams will spend approximately 20 minutes at each station. The activities to be performed at each station are listed below:

1. By reviewing the chapter in the text and using your own good common sense, discuss as many pertinent safety rules as possible. Once these have been discussed, then list five rules that your team considers most critical when working with electrical equipment.
2. There will be a large toolbox in the classroom. Your team must create a list naming every tool contained in the toolbox. You are to use the textbook when you need help with the names.
QUESTION: Considering the variety of tools listed in the textbook, what tools would you suggest still need to be purchased?
3. Read the handout on and the section in Chapter 2 concerning soldering. There will be several items to be soldered at the soldering station. Practice good techniques while soldering the items indicated.
4. There will be an old piece of equipment at this station. You are to use the tools to remove two parts from the equipment. Write a paragraph describing the tools you needed to do the work, any safety precautions that were needed, and what kind of parts (by name is possible) were removed.

To Be Submitted

- ◆ Each group submits their written work as described above within one week of the lab. Students are invited to submit electronically if possible.
- ◆ Individual Lab Assessment Forms must be **fully completed** or your grade will be affected. A participation grade is determined by an average of your self-assessment and peer-assessment. If you do not **completely** fill out the form then you will automatically get a zero. Please submit assessment forms electronically or hard copy no later than during class one week after the lab is performed. In this way you can more effectively assess team members' participation in the written component.

Late submissions are not accepted and a grade of zero is recorded.

Soldering Method

1. Make sure you have all the tools you need: soldering iron, safety glasses, rosin-core solder, mini-clamps, and pliers.
2. Make sure iron is hot and tip is clean. Use sponge provided with iron to clean off tip. Replace tip if can not be sufficiently cleaned.
3. Make sure part that is to be soldered is clean. Can use cotton swabs and alcohol to clean metal surfaces. Make sure it is completely dry before soldering.
4. Align the parts to be soldered in to the position of choice.
5. Apply heat to the joint using the iron. When the materials are hot, apply the solder to the joint (not the iron). If the material was sufficiently heated, the solder should flow evenly over the joint. It should not take a lot of heat to get the material sufficiently hot.
6. Hold parts without moving until the joint is cooled.

Soldering Tips and Information

- A ***cold solder joint*** is the term used to describe a bad solder connection. This can occur for several reasons: the material was not hot enough, the material was not clean enough, the joint was moved during cooling.
- Do not use more solder than is necessary to make a good connection. If the right amount of solder is used, the joint should appear smooth up to and around the connection and will not leave a “blob” of solder around the joint.
- Do not use the iron to melt the solder, the solder should flow over the joint if parts have been heated properly.
- ***Important:*** Recognize that electronic parts are sensitive to heat and can be damaged if overheated. Therefore, if you soldering an electronic component (such as a diode, transistor, or IC package), use a heat sink between the heat and the part. This can be accomplished by clamping a mini-clamp or pliers to a wire between the joint and the sensitive device.
- Read all of section 2.8 in the textbook. In particular, take note of the rules for good soldering.