



## Laboratory Set Up

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**Grade Level:**  
High School

## Laboratory Set Up

### Purpose:

This activity works best as the last lab activity of the year. It is intended for a first year high school chemistry class, however, it can easily be adapted for a biology or physics class.

### Objectives:

Students will:

- review the various lab experiments done during the year.
- review various glassware/equipment used during the year.
- review the chemicals used during the year.
- review the safety equipment needed in a chemistry lab.
- learn how to manage a budget.
- review math skills.

### Materials:

- scientific catalogs
- paper
- order Forms

### Procedure:

1. Students are given a budget of \$20,000.00. They will use their “money” to furnish a new science laboratory for one year of chemistry for 30 students. They cannot exceed the allocated budget.
2. Students are divided into groups of four.
3. First they list the lab experiments conducted during the year. Then, based on the lab activities completed, they will order all the glassware, chemicals, and equipment needed to furnish the lab. They do not have to order fixtures that are part of the room (e.g., desks, chairs, fume hood, and cabinets).
4. Students do not have to order the exact equipment that was used in the actual class. They are encouraged to find better, more efficient ways to do the labs.
5. Students should compare prices from various catalogs to decide where they will get better prices and equipment.
6. A report is to be included with their order justifying briefly what they have ordered.

### Safety:

No particular safety equipment is needed.

### Questions to Ask

1. Which company gave students the most variety?
2. Which company had the best prices?

3. If, for a lab activity, they had to test the density of an unknown compound. Would they have all the materials needed in their order list?
4. Also #3 above can be done with any lab experiment that the students are familiar with.
5. Write an experiment to determine the molecular weight of butane. Again, from their order, would they be able to complete the task? (Points will be lost if they cannot.)
6. Without specifying a particular experiment, ask them to come up with an activity, write a list of materials, procedure and check if they have all necessary equipment.

Ask students to outline one new lab activity they would like to see added along with the equipment and supplies needed for it. They are to include a rationale of why it would be good to add to the curriculum.

**Where to Go from Here:**

Have the person in charge of placing orders at your school talk to the class about how money is allocated for each department. Discuss the school budget.

**References:**

1. Jaeger, D., Weisker, S. (1996). *Chemistry: Visualizing Matter*. New York: Holt, Rinehart and Winston.
2. Carmichael, L. N., Haines, D. F., & Smoot, R. C. (1990). *Laboratory Chemistry*. Ohio: Merrill Publishing Co.
3. Tzimopoulos, N. D., Metcalfe, C.H., Williams, J. E. & Castka, J. F. (1990). *Modern Chemistry*. New York: Holt, Rinehart & Winston.
4. Waterman, E. L., Thompson, S., (1995). *Small Scale Chemistry*. Reading, MA: Addison-Wesley Publishing Co.

## **Laboratory Set Up Student Activity Sheet**

### **Purpose:**

- Review the various lab experiments done during the year.
- Review the various glassware, equipments, chemicals used during the school year
- Review the safety equipments needed in a chemistry lab.
- Learn how to manage a budget.
- Review math skills.

### **Materials:**

- various scientific catalogs
- paper
- order Forms

### **Procedure:**

- Students should divide into groups of four.
- Each lab group is given \$20,000.00. You will use this “money” to supply equipment for a new laboratory. The laboratory will be used for one year by a chemistry class of 30 students.
- Brainstorm within your group. List the various lab activities done by the class during the year.
- Use the catalogs provided to order all the glassware, chemicals, and equipment needed. Keep in my mind you want to have the best prices and equipment--most efficient and most accurate.
- Draw up an order form that will give all the pertinent specifications to the supplier.
- After you have completed your order, as a group, write a brief report justifying what you have ordered.

### **Questions to Answer:**

Answer the following questions on an attached sheet of paper.

1. Which company offered the most variety?
2. Which company gave you the best prices?
3. If you had to test the density of an unknown compound in class, would your order list provide the necessary materials?
4. Write an experiment to determine the molecular weight of butane. Again, from your order, would you be able to complete the task? (Points will be lost if you cannot.)
5. Without specifying a particular experiment, come up with a lab activity, write a list of materials and a procedure. Check to make sure you have all the necessary equipment.
6. Outline one new lab activity you would like to see added to the curriculum along with the equipment and supplies needed for it. Why it should it be included?

*Note: Any procedure students are familiar with, from a lab activity, can be used for question number three.*