

Unit 1 | Handout 57

*IBI Lesson 9: Lifesaver Lab Design*

**Purpose:** To design your lifesaver lab

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**Guiding Question:** - How do scientists conduct a controlled experiment?  
- What affects the rate at which a substance dissolves?

**Your Goal:** Find out how to make a lifesaver dissolve faster in water and explain what you did to find that out.

**Background information**

In this activity you will try to do something to make a lifesaver dissolve faster in water. We will run what is called a controlled experiment. In a controlled experiment, two trials are compared against each other with only one difference between them. That one difference between the trials is called the variable (or the independent variable). The **independent variable** (cause) is what we do to see if it can cause any change within the experiment. This means we decide what the independent variable is and decide how it will be used in the experiment.

To see if the independent variable has any impact, we measure the **dependent variable** (effect). The dependent variable is affected by the independent variable. We can measure if and how the dependent variable changes to determine if our independent variable does anything. What will be the dependent variable in this lab? It will be the mass of the lifesaver. This is because whatever we do (ind. var.) to the lifesaver will change the mass (dep. var.) of the lifesaver.

You and your partner will have to decide what the independent variable is going to be. Mr. Ower is going to run the **control group** (the group in which no independent variable is included in order to get a baseline or "normal" data). In the control, there will be a lifesaver placed into 250mL of water. Nothing else will be done to it. Here are the results: it takes between 18-20 minutes for the lifesaver to dissolve. It loses about .28g of mass per minute.

You have to decide what your independent variable will be (what are you going to do to try to make the lifesaver dissolve faster?). **Remember, you can only change one thing from the control group.**

In the space below, write down some ideas of what you could do to the lifesaver to make it dissolve faster. No materials may be brought from outside of class. So, think of things you can do to the lifesaver with class materials (keep it simple!).

**Wait before moving on!**

Having decided what your independent variable is, you must now answer two very big questions:

1. What exactly are you going to do to test the independent variable?
2. How are you going to collect, record, and report your data?

In the space below, we will write the procedure for this lab. Procedures are a list of steps that tell the reader exactly what to do. All steps of a procedure start with a verb.

Now, you must decide how you will collect, record, and report your data. Answer the following questions.

1. What are we measuring in this lab (what is the dependent variable)?
2. How often should we measure this?
3. How will we measure this?
4. Where will I record this data?