DATE: NAME: CLASS:

CHAPTER 13	Launch Lab: What Determines Voltage?	BLM 13.0.1
HANDOUT		

You might have seen or even built a lemon battery similar to the one in the photograph. In this activity, you will test some of the characteristics of lemon batteries. You will then use your observations to make predictions about commercial batteries.

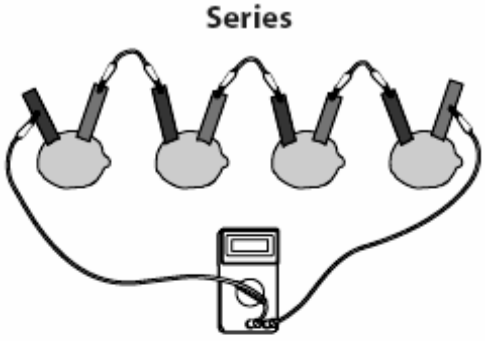
Materials

- 4 zinc strips (1 cm × 5 cm)
- 4 copper strips (1 cm × 5 cm)
- 4 lemons
- fine sandpaper
- 8 electrical leads with alligator clips
- voltmeter (high sensitivity)
- small flashlight bulb

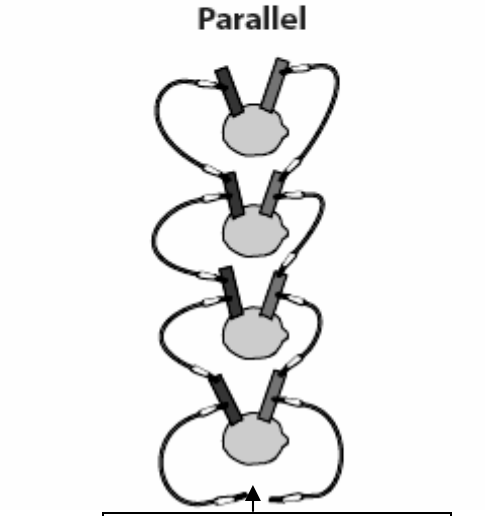
Procedure

1. Clean the zinc and copper strips with the sandpaper. Roll each lemon on the table with your hand on top, pressing down on the lemon to break open the pockets of juice inside.

2. Insert one zinc strip and one copper strip into one lemon, as shown in the photograph. Attach one electrical lead to each strip by using the alligator clips, as shown. Connect the other end of each lead to the voltmeter. Read and record the voltage displayed by the voltmeter.



3. Disconnect the leads from the voltmeter and connect them to the flashlight bulb. If you see any light, describe its intensity.



4. Insert one zinc strip and one copper strip into each of the lemons. Connect the strips as shown in the diagram labelled “series.”

5. Connect the final leads to the voltmeter. Read and record the voltage. Repeat Step 3.

6. Disconnect then reconnect the lemons as shown in the diagram labelled “parallel.” Connect them to the voltmeter and then the light bulb, as shown. Record the voltage and describe the light intensity.

Launch Lab: What Determines Voltage? (continued)

Analysis

1. Speculate about answers to the following questions.

(a) Which connection—single lemon, series lemons, or parallel lemons—produced the highest voltage?

(b) In which case (if any), did the system cause the flashlight bulb to produce the brightest light?

2. Speculate about the difference between a cell and a battery.

3. Why do you think that some batteries are larger than others?

4. As you study this chapter, look for answers to these questions. Compare your speculations with the answers that you find. Correct your answers.