

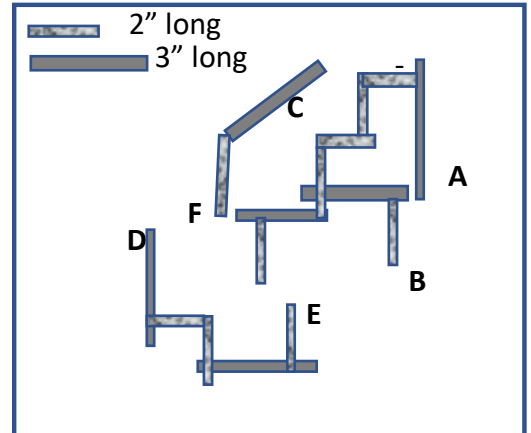
**LIGHTLAB EXTRA SCIENCE ACTIVITY 1: Circuit Maze**

**INTRODUCTION:** In Chapter One of Lightlab, we review the importance of sunlight, test which objects conduct electricity, and have fun creating light. Here, we will build a maze with Aluminum foil, and observe that all electricity flows only through conducting parts that are connected.

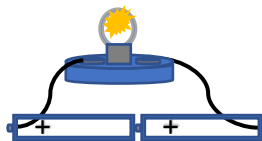
**Materials:** Aluminum foil, glue stick, 2.5 V bulb (in a mount), three alligator wires, two 1.5volt batteries (in a mount), Construction paper cut in half 5 inch x 8 inch

**Procedure:**

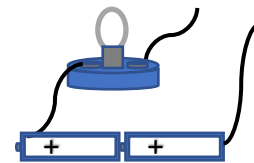
1. Cut strips of Aluminum foil ¼ wide and various lengths: six 3” long, ten 2” long.
2. Use glue stick to build the maze on Construction Paper, as suggested in diagram.



3. Use two alligator wires to connect the bulb to batteries and test to see if the bulb goes on. (The alligators at the end of wires are not shown)



4. Disconnect one of the wires from the battery and add a third wire as shown. Place the free ends along different parts of the Aluminum maze, to check if electricity will flow. This will happen if the bulb lights up, sometimes dimly.



**Results:** Investigate which two parts of the maze, when touched by the 2 wire ends, will light up the bulb? Make a prediction first then test it. Write your results in the table below.

| Wires touching | Your Prediction | Your Observation | Wires touching | Your Prediction | Your Observation |
|----------------|-----------------|------------------|----------------|-----------------|------------------|
| A and B        |                 |                  | B and F        |                 |                  |
| A and C        |                 |                  | D and C        |                 |                  |
| B and C        |                 |                  | D and B        |                 |                  |
| A and F        |                 |                  | D and E        |                 |                  |

Check next page for correct answers!

*“You my Lord, keep my lamp burning; my God turns my darkness into light”* Psalm 18:28

by Suzanne Shera, Author of Lightlab

**Correct Answers:** Light should go ON when wire ends touch A-B, A-F, D-E, B-F because all the Aluminum strips are connected.

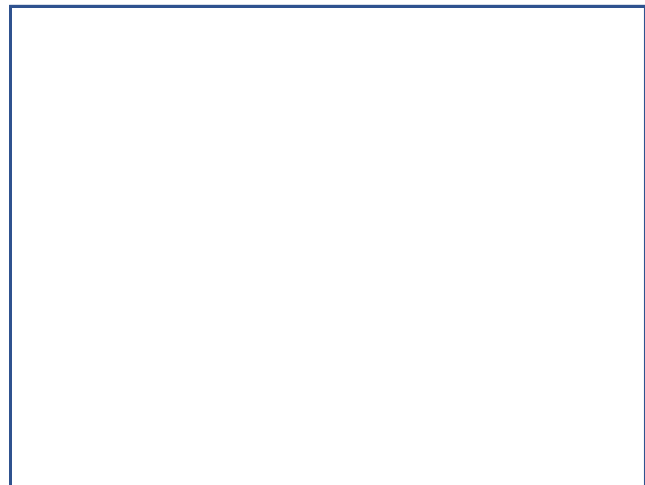
**Troubleshooting:** If the bulb didn't light up between the connecting ends mentioned, the following may have been the case:

- Batteries were too weak or bulb was not 2.5 V
- The alligators weren't placed flat to maximize current flow
- The power of the current will get weak and not light up the bulb if the Aluminum path reaches 30 inches.

**Further Investigation:** Pick one path of the maze that allowed current flow, for example A-B. Put the wire ends at different parts of the path and watch the brightness of the bulb. You should notice that the bulb is brightest when the path between wires is shortest. By the time you place them at A and B exactly, it will shine the least. Hope you agree.

**Extra Fun:** How about you design your own circuit maze and check out which path makes the light shine. Use the space below to draw your design.

Feel free to send us any questions about your design and results. We would love to hear from you regarding any questions you may still have. Just email us at [lightlabetc@gmail.com](mailto:lightlabetc@gmail.com) or contact us via the website itself: [lightlabetc.com](http://lightlabetc.com).



**Final Notes:** In the Bible, there are nearly three hundred references to light, the first one in Genesis 1:3-4. Light is often mentioned in the Bible as a blessing from the Lord because it separates us from darkness. In Chapter One of Lightlab, we discuss why Jesus is called the Light of the world. How about you find one of these verses yourself and write it here: \_\_\_\_\_

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*Lightlab explores the nature of light with a Christian perspective.*

*It is ideal for kids 8-12 years old.*



*"You my Lord, keep my lamp burning; my God turns my darkness into light" Psalm 18:28*