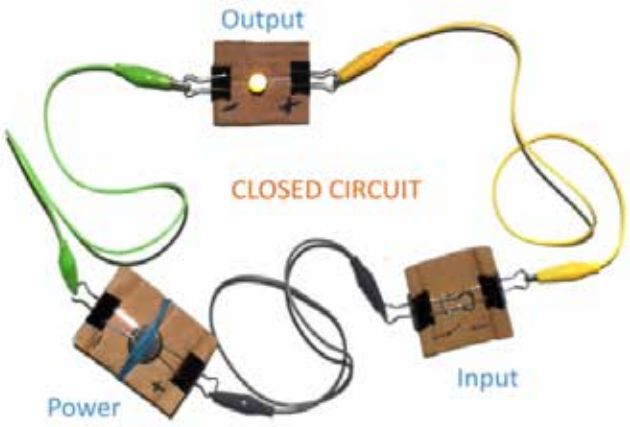
Creating Algorithms: Troubleshoot a Design Problem

An algorithm is a repeatable process that delivers an expected result. An engineer might use an algorithm to help others troubleshoot common design problems. In the example below, students completed the circuit arcade activity (https://makerpromise.org/circuit-arcade/). Then, they created an algorithm to help others troubleshoot why a lightbulb in a circuit may not be lighting up.

1 Part 1: Describe Your Design

Sketch and **label** your design here:

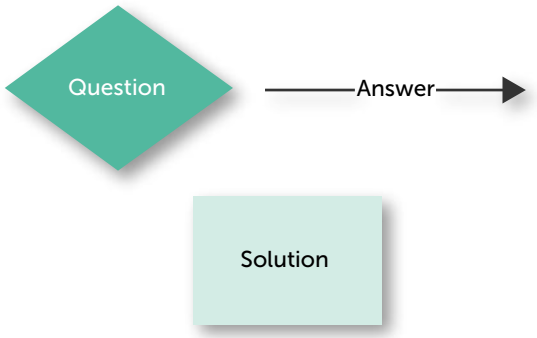


Think about the **parts** of your design and the **purpose** of each part (what it does and what makes it important to the overall function). Then, **troubleshoot** to identify why this part might not work.

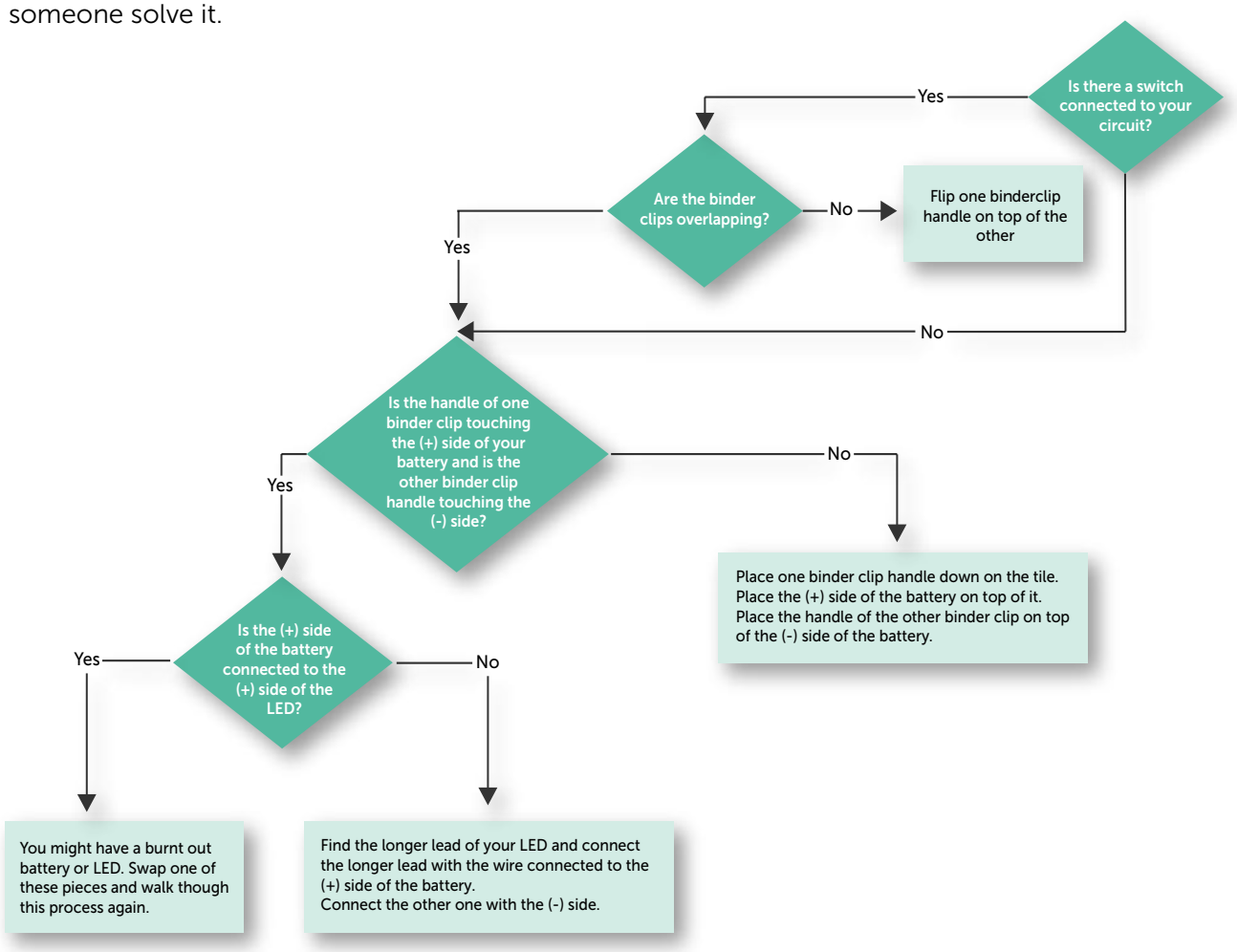
Part	Purpose	Troubleshoot
Output (LED)	The light (LED) turns on, which tells me that my circuit is closed and working.	The switch isn't closed. The LED isn't connected correctly (- to - and + to +). The LED burned out.
Power (Battery)	The battery provides the power needed to turn the light on.	The binder clips handles aren't touching both the (+) or (-) side of the battery. The battery burned out.
Input (Switch)	The switch allows my circuit to open and close.	The binder clip handles aren't overlapping each other.

2 Part 2: Draft Your Algorithm

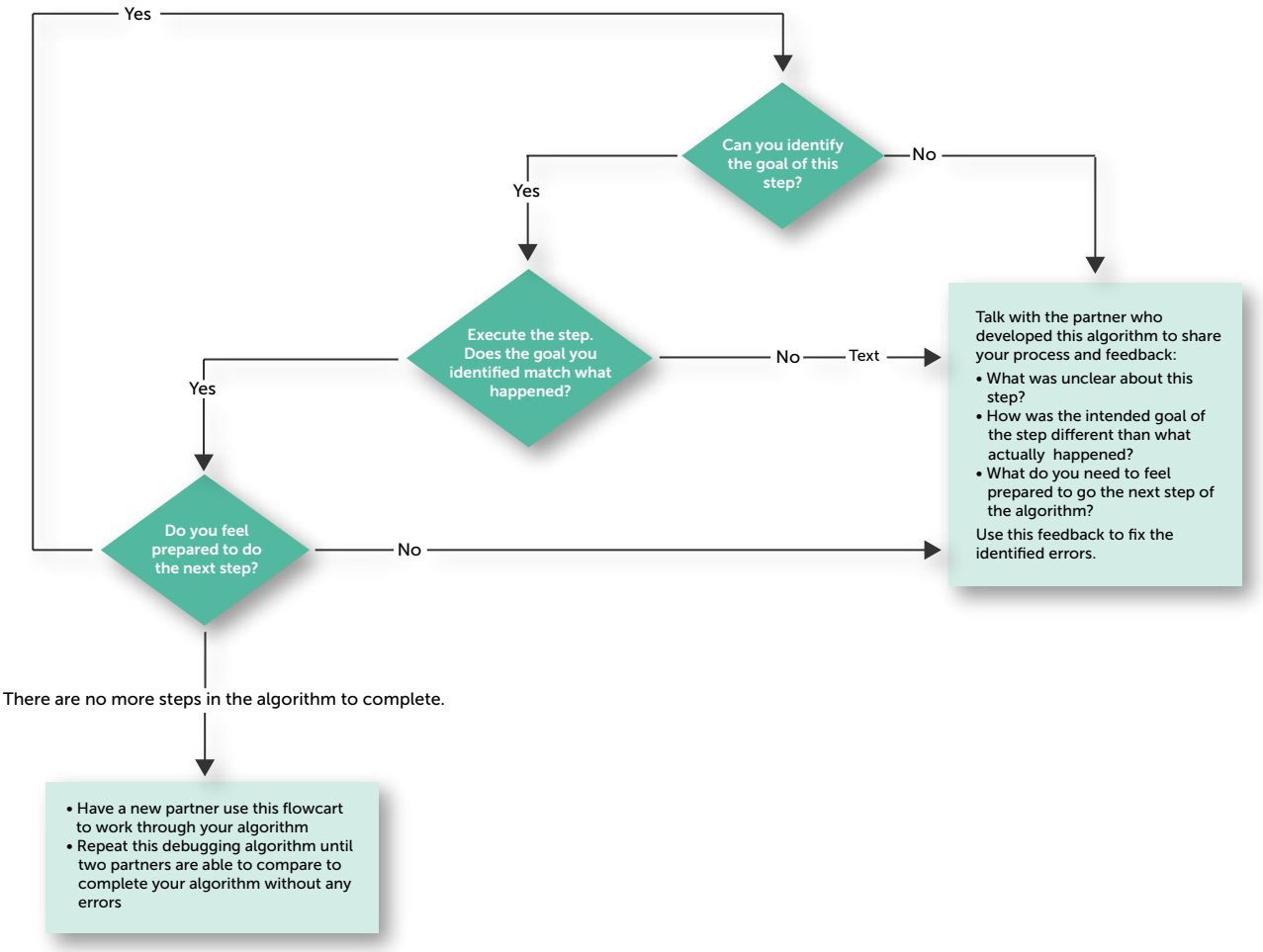
In this assignment, you are going to create an algorithm to solve a design problem. In the example, there are different shapes that represent different types of steps. Use the key below to use the same shapes in your algorithm and create new shapes to show other types of steps. You can also create your own shapes to draft your algorithm on a computer using a tool such as LucidChart, Smartdraw, or Draw.io.



Start by writing your problem below, and then add clarifying questions and solutions to help someone solve it.



3 Part 3: Pair Debugging Algorithm



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