

Soldering Merit Badge Assessment
Derived from the adafruit learning system

Instructions: do each of the following and submit to your instructor.

Section 1: Focus on issues concerning solder and the tools to support soldering.

- 1.) Identify and describe the basic principles that govern the use of solder to attach a component to a circuit board.
- 2.) Identify and describe 3 types of solder and its benefits. Identify the melting temperatures of the aforementioned solder types.
- 3.) Identify and describe the appropriate amount of solder needed to complete a joint.
- 4.) Identify the role of solder diameter and its application.
- 5.) Identify and describe the role of flux in the soldering process.
- 6.) Identify and describe 3 types of soldering tools and their applications.
- 7.) Identify and describe the need for a ESD safe soldering iron.
- 8.) Describe the benefits of an adjustable temperature iron.
- 9.) Identify and describe 3 types of soldering iron tips and their applications.
- 10.) Identify and describe the role of the sponge.
- 11.) Identify and describe 2 methods for de-soldering a component.

Section 2: Focus on different methods for through hole and SMT component soldering

- 1.) Describe the process of soldering a through hole component by hand including what tool you would use, what diameter of solder, what happens if not enough heat is applied, what happens if too much heat is applied, and what happens if not enough flux is used.
- 2.) Describe the process of soldering a SMT component by hand including what soldering tool you would use, what diameter of solder, what happens if not enough heat is applied, what happens if too much heat is applied, and what happens if not enough flux is used.

Section 3: Focus on de-soldering components.

- 1.) Describe the process of de-soldering a through hole component.
- 2.) Describe the two process for de-soldering SMT components.

Section 4: Practicals

- 1.) Construct a through-hole circuit that demonstrates the use of proper technique on all joints.
- 2.) Construct a 2"x2"x2" cube out of 2" strands of solid-core copper wire and solder. This cube must pass a crush test with all joints intact.