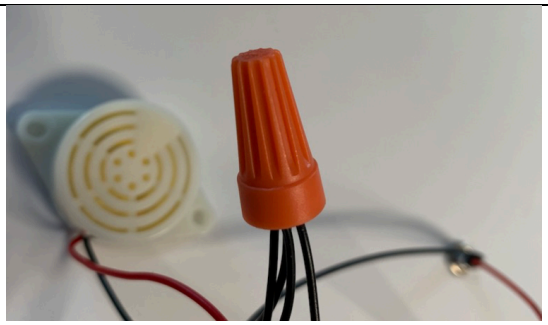
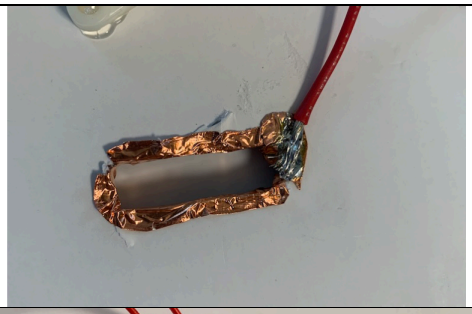
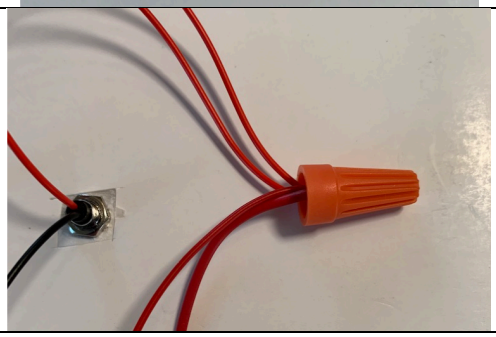
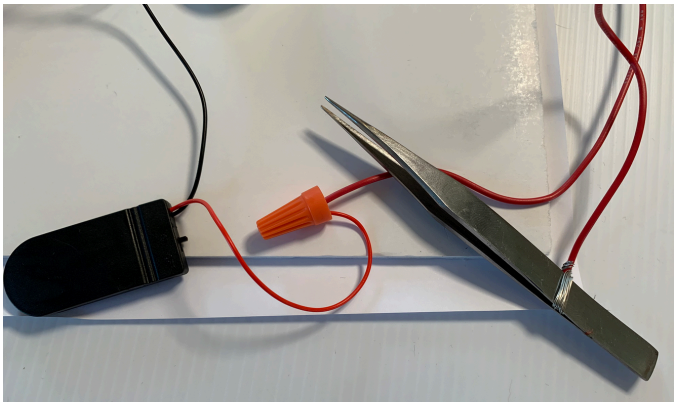
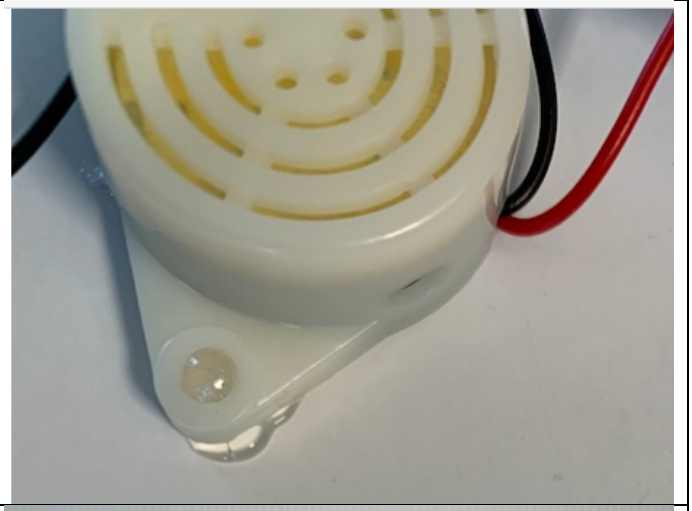
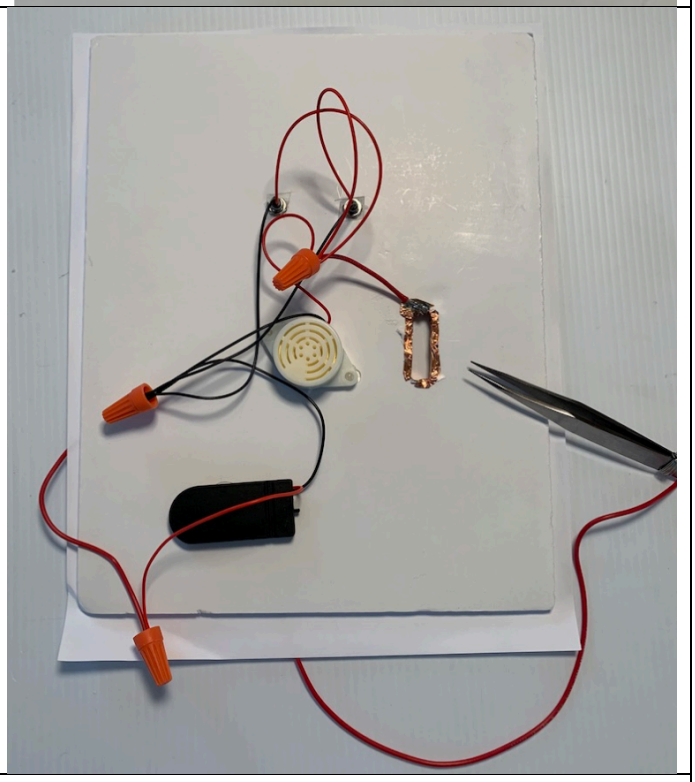
THE STEM ACADEMY®

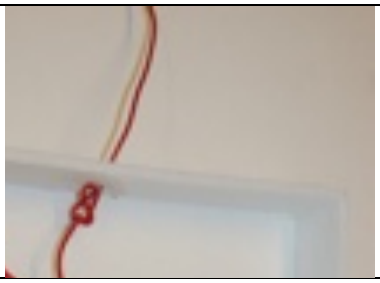
Follow the steps on this assignment and use the knowledge you have gained from the basic electricity unit to complete the game board. Be sure to include and variations or edits your instructor has assigned.

STEP 1: THE CHARACTER BOARD

1. Select and print out your character image.	
2. Use the supplied glue to adhere the character to the 8 x 10 foam core	
3. Pick the locations for the cavities you want to carve out. Make sure they are big enough, but not too large. Mark the holes with a pencil and then use a utility knife to cut them out. 4. Line the hole with the copper foil tape that is provided. Make sure the excess is towards the back as this is where you will make your connections.	
5. Use a small screwdriver or regular pencil to poke out the characters eyes with a small screwdriver. Yes, literally poke them out! Make sure not to make the holes too big. Remove the nut and lock washer from the back of the LED assembly. Cut any excess paper on the back of the board. Insert the LED assemblies and tighten the nuts on the back of the foam core to secure them.	

6. Make sure all the BLACK wires are stripped back ¼". Twist all the black wires together from the LED's, the buzzer and the battery holder. Use a WT3 orange wire nut to connect them all together.	
7. Solder a red wire to each of the openings with copper wire. You may want to tape down the red wire when complete so there is less stress on the soldered area.	
8. Make sure all the RED wires are stripped back ¼". Twist all the red wires together from the LED's, the buzzer BUT **NOT** the battery holder. Use a WT3 orange wire nut to connect them all together.	
9. Cut a long piece of red wire. Strip one end ¼" and the other 1.5 inches. Connect the ¼" end to the battery pack with a WT3 orange wire nut. 10. Clean the oil off the tweezers and wrap the wire around the inside and outside of the upper part of the tweezers. This connection can also be soldered if you like. 11. Load the batteries. Be sure to look inside the battery pack to see what side should be down. Often one is negative side down and one is positive.	

12. If you like, hot glue down the battery pack and buzzer in convenient locations	
13. Your wiring is complete and look something like this. Note that the example here only has one slot for bones.	
14. Use any available foam core scraps to cut (4) 1" x 10" strips of foam core. Turn your character board over so the back is facing you. Hot glue two strips on the sides of the character board. Make sure they are perpendicular to the character board. 15. Trim the remaining two 1" strips to fit the openings on the top and bottom of the character board. Hot glue the top and bottom into place. Cut scrap foam core to cover the foiled cavities and hot glue into place.	

16. Either cut a slot for the tweezer wire to fit through or disconnect and make a hole to feed it through	
17. Use the remaining 8” x 10” foam core board for the back. It can be fastened semi-permanently with 4-6 dots of hot glue on the corners and sides. It can also be held in place permanently with hot glue. Your team may want to develop a hinge and locking mechanism instead of gluing it shut.