

Name: \_\_\_\_\_  
Date: \_\_\_\_\_  
Score(out of 100): \_\_\_\_\_

### SHOCK Hands on Tryout Test

Supplies needed:

- 1 Motor
- 2 Switches
- 2 9V Batteries
- 1 Eraser
- 2 LEDs
- 2 AA batteries
- 1 Large battery of 6V or higher(preferably)
- 1 Long Uninsulated wire
- 5 Resistors blacked out and labeled a, b, c, d, e
- 1 Multimeter
- 1 Compass
- 1 Horseshoe magnet
- 1 Bar magnet
- 10ish Wires

There are 5 stations, you may work on anything on this test at the station you are at, not just the station in front of you, make this work out in your favor. Good luck!!! Narwhals are boss.

1. Create an electrical eraser with the motor, a switch, an eraser, a couple of wires, and a 9v battery that can erase the marks that are underneath.

Supervisor Signature: \_\_\_\_\_

2a. Create a circuit with 2 LEDs, 2 AA batteries, and as many wires as you want in a way such that the LEDs are the brightest. Draw this circuit.

b. Measure the voltage across each LED(Label on schematic diagram)

c. Find the current across each LED LED1:\_\_\_\_\_ LED2:\_\_\_\_\_

d. If each Led has resistance of  $10\Omega$ , find the watts dissipated across each LED

LED1:\_\_\_\_\_ LED2:\_\_\_\_\_

ANSWER SECTION

3. With the materials given, create an electromagnet that can be turned on and off. With this magnet, move ten paperclips across this page. Supervisor Signature:\_\_\_\_\_

Draw the magnetic fields of the electromagnet below

Explain how you can make this electromagnet stronger(4 ways)

4. Measure the resistance of each resistor with a multimeter

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

5. With the 5 resistors, create a circuit with the least possible resistance wired to a 9v battery.

- a. Draw this circuit
- b. Find the voltage across each resistor(label on schematic diagram)
- c. Find the current across each resistor(label on schematic diagram)

ANSWER SECTION

6. Using the magnet, find the north and south poles of the magnets

Horseshoe white: \_\_\_\_\_

Horseshoe blue: \_\_\_\_\_

Bar red: \_\_\_\_\_

Bar green: \_\_\_\_\_