**Electric Field Map Lab**

**Objectives:** Determine the shape of the electric field lines by drawing equipotential lines around different geometrically shaped charged electrodes.

![Diagram of electric field lines and equipotential surfaces](image)

**Theory:** In the image shown above, the dashed lines are called equipotential lines; this is because every point on a given dashed line loop has the same potential. Once the equipotential lines are made, the Electric field is determined by taking the change in potential divided by the change in distance.

In the image above, and the direction of the electric field is perpendicular to the equipotential lines.
**Materials:** Two (1.5 volts) batteries, Digital Multimeter, one red wire for the positive electrode, one black wire for the negative electrode, and a conductive paper with a pre-drawn shape.

**Procedure:**

Part I: Pick one design and map the equipotential lines around the charged electrodes. Record the total change in potential of the batteries and divided that voltage by 5. This number will be the incremental value of equipotential lines that you will be making.

Part II: Pick a second design and map the equipotential lines around the charged electrodes and repeat the procedure in part I.

**Scenario:** Use the aluminum foil to create a conducting pattern. No two points on the aluminum paper can be closer than 10 cm. The group (of two – a group of three are disqualified) that produces the largest electric field between two the aluminum foil patterns will receive a Level III Optional.