

## **Physics Lab**

### **Aluminum Foil Text Book Capacitor**

*This lab will be assessed against all the criteria*

#### **Introduction:**

A capacitor is a device that stores charge. The amount of charge a capacitor can hold for a given potential difference across it is called the capacitance.  $C=Q/V$

The capacitance of two parallel plates depends on the plate separation, on the area of the two plates and on the type of material between them. The purpose of this lab is to

- investigate the quantitative nature of the dependence of capacitance on plate separation and on the area of the two plates.
- determine the dielectric constant for text book paper.

#### **The Capacitor:**

Make two sheets of Aluminum foil of equal size and place them in your physics text book separated by a reasonable number of pages. The sheets should not extend past the edges of the book except for small tabs for making the connection with the capacitance meter. You can measure the capacitance directly with the capacitance meter.

#### **Procedure:**

Start by giving a quantitative relationship between capacitance and each of the variables under investigation and give a physical explanation for why you expect these relationships to be valid. You may refer to your notes, but you should also explain conceptually why the relationships hold.

Design an experiment that allows you to collect enough data to test the theory. Use graphical analysis to quantitatively analyse the relationship between capacitance and each of the variables you are investigating. You should also be able to use each of these graphs to determine the dielectric constant for textbook paper.