Name: Date: Class:

Practicing Measuring Capacitance / Testing Your Sensor Key

Directions: The diagrams below show different objects being tested on a capacitance sensor. Use the digital multimeter readings to complete the calculations and then answer the questions.

The Water Bottle	
Initial Capacitance (nF)	**0.19 nF**
Final Capacitance (nF)	**0.50 nF**
Capacitance of Object (nF) (Final Capacitance – Initial Capacitance)	**0.50 nF – 0.19 nF = 0.31 nF**

The Pencil Case	
Initial Capacitance (nF)	**0.23 nF**
Final Capacitance (nF)	**0.37 nF**
Capacitance of Object (nF) (Final Capacitance – Initial Capacitance)	**0.37 nF – 0.23 nF = 0.14 nF**
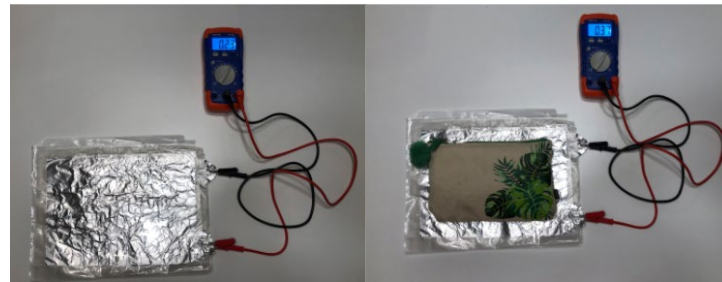
The Stack of Books	
Initial Capacitance (nF)	**0.20 nF**
Final Capacitance (nF)	**1.03 nF**
Capacitance of Object (nF) (Final Capacitance – Initial Capacitance)	**1.03 nF – 0.20 nF = 0.83 nF**

TeachEngineering

Engineering
UNIVERSITY OF COLORADO BOULDER

According to your calculations on the last page, answer the following questions:

1) Which object had the least capacitance? **The Pencil Case**

2) Which object had the highest capacitance? **The Stack of Books**

Your sensor does NOT measure pressure, but capacitance and pressure are related. As capacitance increases, pressure also increases. Based on this information…

3) Which object do you think exerts the least pressure? **The Pencil Case**

4) Which object do you think exerts the most pressure? **The Stack of Books**

5) Explain on the lines below how you decided to assign the least and most pressure to the objects in numbers 3 and 4:

Above states that as capacitance increases, pressure also increases. So because the pencil case has the least capacitance, I would hypothesize that it also exerts the least pressure and is lightest. The stack of books had the highest capacitance, therefore I would hypothesize that it exerts the most pressure and is the heaviest.

Testing YOUR Sensor Directions: Choose one to three objects from your classroom to test on your capacitance sensor and record your data below:

Object	Initial Capacitance (nF)	Final Capacitance (nF)	Capacitance of Object (nF) Final Capacitance – Initial Capacitance
Answers will vary			

Object tested with the most capacitance: _____

Object tested with the least capacitance: _____