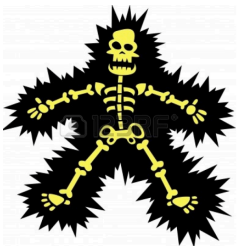
Name _____ Date _____ Period _____

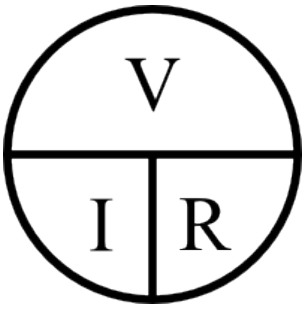


ELECTRICITY

QUESTION: Will pencil lead conduct electricity? If so, does the resistance to the flow of electrons increase or decrease as electrons flow through a greater length of pencil lead?

BACKGROUND:

Ohm's Law describes the relationships between current (*I*), voltage (*V*), and resistance (*R*). The electromotive force (V) in volts is equal to the current (I) in amperes times the resistance (R) in ohms; V = I x R.



To solve for any single value in this equation when the other two are known, use the figure to the right and cover up the unknown value with a pencil eraser. Then, solve the mathematical equation by performing the mathematical operation indicated by the position of the remaining letters.
So, to find voltage, V = I x R, to find current, I = V/R, and to find resistance, R = V/I.

Resisters are very important components in electrical circuits because they control the amount of current that flows when a particular voltage is applied. Resisters provide resistance, thereby controlling the flow of electrons in an electrical circuit.

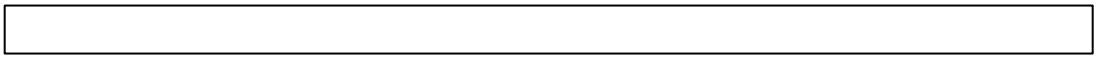
MATERIALS:

- Ohmmeter
- Pencil, #2

PROCEDURE:

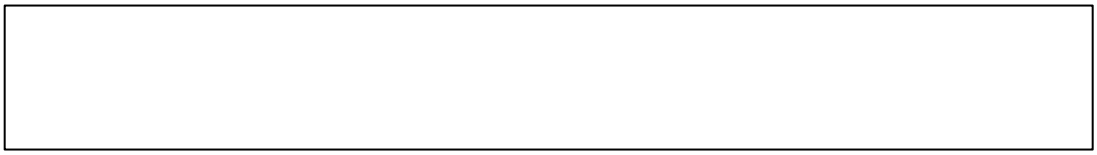
1. Using a #2 pencil, completely color in rectangle A and B below. For best results, color them in very dark.
2. Place the common lead from an ohmmeter at point X on *Rectangle A*. *Note: Make sure the lead is touching the pencil drawing.*
3. Slide the second lead from point 1 to point 10 and record the measured resistance on the ohmmeter for each point on the rectangle. How much does the resistance change as the lead is moved farther away from point X?
4. Repeat steps 2 and 3 with *Rectangle B*. Does the width of the rectangle affect the resistance?

X 1 2 3 4 5 6 7 8 9 10 Y



Rectangle A

X 1 2 3 4 5 6 7 8 9 10 Y



Rectangle B

5. Graph the results on the next page.

Title and Label your Graph.