

Resistance In A Wire Student Worksheet

Introduction: The resistance in a wire depends on several variables. Most of these are common quantities that are familiar. The one variable that is new is the resistivity of the material. The symbol is ρ , rho. The resistivity takes into account the type of material from which the material is made.

Lab Activity: Log on and go to the PhET website (PhET.colorado.edu) Go to simulations, then "electricity" then to the following:

"Resistance in a Wire":

1. In this simulation, what are the variables in the relationship. Write the formula below, and make a list of the variables and indicate the units used to measure each one.

2. Try increasing the **resistivity** of the resistor. The picture at the bottom of the screen shows what would physically happen to the resistor.

a) How does this change the "look" of the resistor?

b) Describe how that relates to the formula you just wrote (direct, or inverse).

c) What happens to the value of "R" (Resistance)?

d) What would you have to do to change the resistivity of a resistor in a circuit?

3. Now increase the length (L) (you would essentially be designing a different resistor, since you can't do this to one you will be using in a circuit). What happens to " R "? WHY?

4. Now increase the area (A) of the resistor. What happens to " R "? WHY?

5. Write a summary about the different relationships you looked at in the properties and measurements of a resistor.