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| Name | **Unit 1 Factors Affecting Resistance (Practice Lab)** | Date |
| [**https://phet.colorado.edu/sims/html/resistance-in-a-wire/latest/resistance-in-a-wire\_en.html**](https://phet.colorado.edu/sims/html/resistance-in-a-wire/latest/resistance-in-a-wire_en.html) |  |
| **Part A: Effect of Resistivity on Resistance**  |  |
| **Problem:** What effect will the resistivity of a wire conductor have on the resistance of the wire conductor? | **/C00** |
| **Hypothesis:** (a mathematical relationship; control – 1K, variables – 1C; math relationship – 1T; variable order – 1T) | **/K01****/T02****/C01** |
| **Table 1 – Effect of Resistivity on Resistance** (Constants – 1K; ~~Headings – T;~~ Values – 1C)**Constant *\_L (length)\_\_* = \_\_\_\_\_\_\_\_\_\_; Constant \_*A (cross-sectional area)*\_\_ = \_\_\_\_\_\_\_\_\_\_**

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| **Trial** | **Repetition** | **Resistivity (Ωcm)**  | **Resistance****(Ω)** |  |
| **1** | **1** |  |  |  |
| **2** | **1** |  |  |  |
| **3** | **1** |  |  |  |
| **4** | **1** |  |  |  |
| **5** | **1** |  |  |  |

 | **/K01****/T00****/C01** |
| **Graph 1 – Resistance vs. Resistivity** (~~Correct variables selected, correct title – T~~; Table of values (headings, data) correct – K; Axes scale, points plotted correctly, – K; Axes labels - in correct location, error circles around data points – C; Axes labels – English and math, SI units – C; Best fit line or curve selected, drawn properly – T)

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 | **/K02****/T01****/C02** |
| **Conclusion:** (a mathematical relationship; graph referred to – 1K, control – 1K, variables – 1C; math relationship – 1T; variable order – 1T) | **/K02****/T02****/C01** |
| **Totals** | **K/18** | **T/15** | **C/15** | **A/08­­­** |
| **Page Totals** | **K/06** | **T/05** | **C/05** | **A/00** |
| **Part B: Effect of Length on Resistance**  |  |
| **Problem:** What effect will the length of a wire conductor have on the resistance of the wire conductor? | **/C00** |
| **Hypothesis:** (a mathematical relationship; control – 1K, variables – 1C; math relationship – 1T; variable order – 1T) | **/K01****/T02****/C01** |
| **Table 2 – Effect of Length on Resistance** (Constants – 1K; ~~Headings – T;~~ Values – 1C)**Constant *\_ρ (Resistivity)\_\_* = \_\_\_\_\_\_\_\_\_\_; Constant \_*A (cross-sectional area)*\_\_ = \_\_\_\_\_\_\_\_\_\_**

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| **Trial** | **Repetition** | **Length** **(cm)**  | **Resistance****(Ω)** |  |
| **1** | **1** |  |  |  |
| **2** | **1** |  |  |  |
| **3** | **1** |  |  |  |
| **4** | **1** |  |  |  |
| **5** | **1** |  |  |  |

 | **/K01****/T00****/C01** |
| **Graph 2 – Resistance vs. Length** (~~Correct variables selected, correct title – T~~; Table of values (headings, data) correct – K; Axes scale, points plotted correctly, – K; Axes labels - in correct location, error circles around data points – C; Axes labels – English and math, SI units – C; Best fit line or curve selected, drawn properly – T)

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 | **/K02****/T01****/C02** |
| **Conclusion:** (a mathematical relationship; graph referred to – 1K, control – 1K, variables – 1C; math relationship – 1T; variable order – 1T) | **/K02****/T02****/C01** |
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| **Part C: Effect of Cross-Sectional Area on Resistance**  |  |
| **Problem:** What effect will the cross-sectional area of a wire conductor have on the resistance of the wire conductor? | **/C00** |
| **Hypothesis:** (a mathematical relationship; control – 1K, variables – 1C; math relationship – 1T; variable order – 1T) | **/K01****/T02****/C01** |
| **Table 3 – Effect of Cross-Sectional Area on Resistance** (Constants – 1K; ~~Headings – T;~~ Values – 1C)**Constant *\_L (length)\_\_* = \_\_\_\_\_\_\_\_\_\_; Constant *\_ρ (resistivity)\_\_* = \_\_\_\_\_\_\_\_\_\_**

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| **Trial** | **Repetition** | **Cross-sectional Area****(cm2)**  | **Resistance****(Ω)** |  |
| **1** | **1** |  |  |  |
| **2** | **1** |  |  |  |
| **3** | **1** |  |  |  |
| **4** | **1** |  |  |  |
| **5** | **1** |  |  |  |

 | **/K01****/T00****/C01** |
| **Graph 3 – Resistance vs. Cross-sectional Area** (~~Correct variables selected, correct title – T~~; Table of values (headings, data) correct – K; Axes scale, points plotted correctly, – K; Axes labels - in correct location, error circles around data points – C; Axes labels – English and math, SI units – C; Best fit line or curve selected, drawn properly – T)

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 | **/K02****/T01****/C02** |
| **Conclusion:** (a mathematical relationship; graph referred to – 1K, control – 1K, variables – 1C; math relationship – 1T; variable order – 1T) | **/K02****/T02****/C01** |
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| **Application:** 1.a) State two (2) random errors and explain how those errors could be reduced.Random Error 1:Reduced by:Random Error 2:Reduced by: 1.b) State two (2) systematic errors and explain how those errors could be reduced.Systematic Error 1:Reduced by:Systematic Error 2:Reduced by: | **/A04****/A04** |
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| ***For future labs*****Data Analysis:****Sample Calculation of Mean Average Period of Pendulum from Table 1, Trial 1** (formula – 1K; substitution – 1T; answer – 1K; units in substitution and answer– 1C) | **/K02****/T01****/C01** |