Electricity & Circuit Investigation

SNC1W | Student laboratory assignment | 1 of 4

Prepare for your investigation

Name: _____ Date: _____ Class: _____

Research question

How can observations from this virtual investigation explain electricity & circuit investigation?

Learning goal: use the virtual model to gather evidence, explain electricity & circuit investigation and communicate a supported conclusion.

Materials: WorksheetGalaxy virtual laboratory, this assignment, calculator or spreadsheet if needed. Virtual observations only; do not recreate hazardous procedures or perform physical fitness tests without teacher approval.

1. Define two relevant scientific terms from the Background Information tab. (K/U)

2. Write a prediction or hypothesis with a scientific reason. (K/U, T/I)

3. Identify the variable or feature compared, the measured outcome and constants or consistent observation criteria. (T/I)

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Perform the virtual laboratory

Open the corresponding virtual lab and read Background Information. Follow the investigation instructions below. Record authentic simulated results; do not invent data.

- Predict which circuit has greater total resistance when both loads are identical: series or parallel.
- Set the source to 6.0 V and both loads to 10 Ω. Record the calculated source current and each load's voltage and current in series.
- Switch to parallel without changing the source or loads. Record the new values.
- Hold the source voltage constant and change R_2 to 20 Ω, then 30 Ω. Record at least four trials.
- Use the graph to compare total current against total resistance. Explain the relationship.
- Calculate the energy used in 60 s for one trial, then compare with the simulation.
- Explain how a real battery, wires, or incandescent lamps might differ from this model.

Record each completed observation using the simulator’s record control when available. Use Data & Graphs to review results. Export CSV if available; attach additional rows or screenshots when needed.

Record the exact settings and any changes to the method.

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Observations & results

Enter the actual results. Keep trial IDs consistent between continued tables. Attach the full exported data or extra sheets when the procedure requires more rows. Include units as displayed.

Data table 1

Trial / item	Type	V source (V)	R_1 (Ω)	R_2 (Ω)	R total (Ω)

Data table 1 — continued (2)

Trial / item	I source (A)	V_1 (V)	V_2 (V)	I_1 (A)	I_2 (A)

Data table 1 — continued (3)

Trial / item	P total (W)	E (J)

Qualitative observations / sample calculation (show units where applicable)

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Analysis, conclusion & assessment

4. Present a labelled graph of a measured relationship, or an annotated diagram / comparison chart for qualitative investigations. Attach it separately. Explain the pattern using recorded evidence. (C, T/I)

5. Describe how source current changes when total resistance increases at constant voltage. (K/U, A)

6. Explain why voltage divides in series but is the same across parallel branches. (K/U, A)

7. Calculate power and energy for one trial, showing units and work. (K/U, A)

8. Explain why household electrical devices are generally connected in parallel rather than series. (K/U, A)

Conclusion and evaluation: answer the research question, revisit the prediction using evidence, identify a model limitation and propose an improvement. (T/I, A)

Submit this assignment plus your completed Lab Report (printed or saved as PDF from the lab) and any supporting data/figures.

K/U: accurate concepts /10	T/I: method, data, reasoning /12	C: clear tables, units, report /8	A: explanation, conclusion, transfer /10

Total: /40