SCIENCE:

The unit on **series and parallel circuits, electrical flow, resistance, and switches** can connect directly to the **ACT College and Career Readiness Standards (CCRS) for Science**. While the ACT doesn't test specific content knowledge, it heavily emphasizes **interpreting data, designing investigations, and evaluating models**—all of which are embedded in this unit.

Potential ACT Science Standards Covered

This unit aligns with three key areas tested on the ACT Science section:

1. **Interpretation of Data** – The ability to analyze experimental results and identify patterns.
2. **Scientific Investigation** – Understanding variables, designing experiments, and predicting outcomes.
3. **Evaluation of Models and Inferences** – Using data to justify scientific conclusions.

1. Interpretation of Data (Score 16-36)

At different ACT score ranges, students develop progressively deeper analytical skills:

- **(16-19):** Identifying trends in circuit data, such as resistance and voltage relationships.
- **(20-23):** Comparing results from multiple trials, such as measuring voltage drop across resistors.
- **(24-27):** Predicting how results from one type of circuit (series) might apply to another (parallel).
- **(28-32):** Analyzing graphical data on Ohm's Law and circuit behavior.
- **(33-36):** Using mathematical relationships, like **V = IR**, to predict and explain circuit performance.

2. Scientific Investigation (Score 20-36)

Students engage in the scientific process through hands-on circuit design:

- **(20-23):** Identifying control variables in an experiment.
- **(24-27):** Predicting how adding or removing elements (switches, resistors) changes circuit behavior.
- **(28-32):** Evaluating the validity of circuit experiments.
- **(33-36):** Designing independent investigations on circuit efficiency, materials, and resistance.

3. Evaluation of Models and Inferences (Score 24-36)

Students develop reasoning skills by testing and refining their circuit models:

- **(24-27):** Determining which model—series or parallel—best represents experimental data.
- **(28-32):** Predicting circuit behavior when components change (e.g., removing a resistor or battery).
- **(33-36):** Justifying conclusions with experimental evidence and real-world applications.

Creativity & Problem-Solving Integration

This unit goes beyond memorization. It fosters **engineering design thinking** and **scientific reasoning**, both of which are essential for **STEM careers and higher ACT performance**:

- **Creativity in Circuit Design** – Students **build, test, and troubleshoot circuits**, learning to think critically.
- **Real-World Application** – They connect **electric flow, resistance, and switches** to **technology, household wiring, and energy systems**.

Summary

This unit can be **ACT-aligned** and **engages students in scientific inquiry**, preparing them for higher ACT Science scores (**24-36 range**). By incorporating **hands-on experiments, data analysis, and problem-solving**, students build skills essential for **college and career success**.