**MATH:**

**ACT Math Alignment – Build your own Circuitry Game**

**Circuit Calculations & Logical Reasoning**

Students apply mathematical reasoning to analyze circuit performance, calculate resistance, and interpret electrical efficiency. Through hands-on activities, they develop problem-solving skills essential for ACT Math, using formulas like Ohm’s Law and power equations to optimize circuitry game designs.

**Potential ACT Math Standards Covered in This Unit**

This unit connects to ACT math skills in five key areas:

**ACT Math Rating Scale – Problem Solving & Data Interpretation**

1. **(16–19) Understanding basic voltage, current, and resistance concepts**
* Define and identify voltage (V), current (I), and resistance (R)
* Perform basic arithmetic with units (e.g., volts, ohms, amps)
* Match circuit symbols with their corresponding components
1. **(20–23) Applying Ohm’s Law in series and parallel circuits**
* Use the formula V = IR to solve for unknowns
* Calculate total resistance in simple series and parallel circuits

Apply proportional reasoning to current and voltage in different setups

1. **(24–27) Analyzing electrical efficiency through calculations**
* Solve for power using P = IV
* Compare efficiency of components using energy loss equations
* Analyze changes in performance when voltage or resistance is varied.
1. **(28–32) Interpreting data from circuit performance experiments**
* Read and analyze tables or graphs showing current and voltage data
* Use experimental results to calculate unknown values
* Evaluate circuit behavior based on changes in input values
1. **(33–36) Solving advanced electrical circuit problems**
* Solve multi-step problems involving combinations of series and parallel circuits
* Interpret complex circuit diagrams and apply multiple formulas
* Use algebraic reasoning and systems of equations to optimize circuit designs

**Why This Matters for ACT Preparation**

By engaging with real-world circuit design scenarios in the Circuitry Game Kit, students:

✅ Strengthen arithmetic, algebraic reasoning, and proportional thinking—core ACT math skills.
✅ Apply formulas like Ohm’s Law and P = IV to solve problems involving voltage, current, and resistance.
✅ Interpret data from circuit performance and troubleshoot designs using logic and quantitative analysis.

These hands-on, math-based activities help students connect theoretical concepts to real-life electrical systems—just as they’ll be expected to do on the ACT and in future STEM careers.