UNIT: CIRCUITRY GAME

ACT-Based Science: Buzzer Frequency Analysis

### Here are ACT-aligned science activities for the **Build Your Own Circuitry Game** that help students engage in real-world scientific practices such as experimental analysis, data interpretation, and variable testing related to voltage, current, and resistance in circuit design.

### Objective:

Students examine how voltage affects buzzer sound frequency.

MATERIALS NEEDED:

* Buzzers
* Power sources
* Worksheet

Student Directions:

**Goal:**
You will investigate how changing voltage levels affect the sound (frequency) produced by a buzzer. This experiment will help you practice scientific skills like forming hypotheses, collecting data, identifying patterns, and drawing conclusions—just like on the ACT Science test.

**Step 1: Set Up the Circuit**

* Gather your buzzer, wires, and power source.
* Build a basic circuit connecting the buzzer to a low voltage (e.g., 3V).
* Make sure all connections are secure and the buzzer activates.

**Step 2: Test Different Voltage Levels**

* Gradually increase the voltage (e.g., 3V, 6V, 9V).
* For each voltage level, **carefully observe and listen** to the buzzer.
* Use a frequency meter or app if available, or estimate changes in pitch (higher/lower sound).

**Step 3: Record Your Data**

* On your worksheet, note the voltage level and the corresponding buzzer sound or frequency.
* Use a table to keep your information organized and easy to interpret.

**Step 4: Analyze Your Results**

* Look for patterns: Does the pitch increase, decrease, or stay the same as voltage increases?
* Discuss what might be causing these changes in terms of how electricity affects a buzzer.

**Step 5: Draw Conclusions**

* Write a short summary: What did you learn from the experiment?
* Were your results consistent with your predictions?
* How could this knowledge be useful in designing a game circuit?

## ACT-Style Question:

## What happens to buzzer frequency as voltage increases?

## Increases

## Decreases

## No change

## Turns off completely

## **Why These Activities and Questions Matter**

By engaging in science-based activities connected to the **Build Your Own Circuitry Game**, students:

✅ Practice interpreting experimental data from circuit tests, including voltage, current, and resistance readings.
✅ Strengthen their ability to analyze variables, make predictions, and draw conclusions from electrical experiments.
✅ Develop scientific reasoning skills by designing circuits, testing hypotheses, and troubleshooting system performance.

These skills reflect the ACT Science section’s emphasis on **data representation, experimental analysis, and scientific inquiry**—helping students become confident, analytical thinkers ready for college-level science and STEM careers.