**📍 Station 3: Jungle Sound Beacon**

**NGSS: 4-PS3-2**  
**Objective:** Create a hidden sound beacon that activates when someone steps on a pressure plate.

**Materials:**

 2 **foil squares**

 1 **small sponge** or **thin soft cardboard**

 1 **buzzer**

 **Battery + holder**

 **Alligator clip wires** (or foil strips)

 **Tape**

 **Paper labeled “LEAVES”** to hide the trap

**Student Directions:**

**Step 1: Build the Pressure Plate**

* Tape **one foil square** to the top of the sponge.
* Tape the **second foil square** to the bottom of the sponge (or soft surface).
* The goal: when someone steps on it, the sponge compresses and the foil squares **touch**!

**Step 2: Make the Circuit**

* Connect one foil square to one side of your buzzer using a wire.
* Connect the other foil square to the other side of the buzzer.
* Complete the circuit by attaching the buzzer to the **battery holder** with wires.
* **Test it!** The buzzer should only sound **when the foil pieces press together.**

**Step 3: Disguise Your Beacon**

* Place the sponge + foil sandwich under a piece of paper labeled **“LEAVES”**.
* Try stepping on it gently—**can you hear the alarm?**

**Record & Reflect:**

**🎧 What causes the buzzer to sound?**  
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(Hint: Think about what closes the circuit.)

**🔊 Why would this be helpful in an emergency or jungle rescue?**  
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(Hint: Could rescuers find someone who stepped on it?)

**💡 Optional Challenge:**  
Can you design your beacon to only work **at night** or when the person is **really heavy**? Brainstorm an upgrade!  
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### 📍 **Station 3: Jungle Sound Beacon**

**NGSS Standard: 4-PS3-2**  
Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.  
→ In this activity, students explore how **electrical energy** transfers through a closed circuit to produce **sound energy** from the buzzer.

### ✅ **ITEEA STEL Standards – Elementary Level**

**STEL 1A** – The study of technology uses knowledge and skills from other subject areas.  
→ Students apply science (energy and circuits) and math (measurement, logic) in a hands-on task.

**STEL 2A** – Technological systems are designed to meet needs and wants.  
→ The activity simulates a safety or emergency system in a jungle environment—connecting design to real-life utility.

**STEL 4A** – Break systems into parts to see how they work together.  
→ Students work with a multi-part system: a pressure plate, foil, wires, buzzer, and power source.

**STEL 5A** – Technologies can be used to communicate or cause an effect.  
→ The buzzer sound communicates an action—triggered by a pressure-sensitive switch.

**STEL 6A** – Creativity and innovation improve technology.  
→ Students brainstorm ways to improve or modify the beacon, such as making it weight-sensitive or time-specific.

**STEL 7A** – The engineering design process helps people solve problems.  
→ This is a full design task: build → test → reflect → improve.

**STEL 8A** – Design is a creative process for meeting needs and wants.  
→ Students creatively build a tool to signal presence—a possible life-saving or rescue device.

### ✅ **Common Core Math Standards – Elementary Level**

**CCSS.MATH.CONTENT.3.MD.B.3** – Draw a scaled picture graph and a bar graph to represent data.  
→ Optional: Students can collect data on how much pressure triggers the sound and graph the results.

**CCSS.MATH.CONTENT.4.MD.A.1** – Solve problems involving measurement and conversion.  
→ Students might measure sponge thickness, foil size, or force applied to trigger the buzzer.

**CCSS.MATH.PRACTICE.MP1** – Make sense of problems and persevere in solving them.  
→ Students must troubleshoot wiring or circuit problems when the buzzer doesn’t sound.

**CCSS.MATH.PRACTICE.MP5** – Use appropriate tools strategically.  
→ Use of circuit tools, foil, sponge, and paper are key to functioning design.

**CCSS.MATH.PRACTICE.MP7** – Look for and make use of structure.  
→ Recognize how pressure plates work as open/close switches in electrical circuits.

### ✅ Summary

This activity aligns with **NGSS 4-PS3-2**, supports **ITEEA STEL design and systems thinking standards**, and naturally integrates **measurement, reasoning, and data collection from Common Core Math**. Students explore how **electrical systems** can be designed to respond to **real-world inputs** like pressure—perfect for integrated STEM instruction.