**📍 Station 4: Leaf Trail Light Path**

**NGSS: 4-PS3-4**  
**Objective:** Use a circuit with “leaf-shaped” LEDs to light a path out of the jungle.

**Materials:**

 Green **LED lights**

 **Battery + holder** (2 AA or 9V)

 **Green construction paper** (cut into “leaves”)

 **Wire or foil strips** (to connect the circuit)

 **Tape**

 Optional: Paper map or cardboard path base

**Student Directions:**

**Step 1: Make Your Glowing Leaves**

* Take a piece of green paper and cut it into leaf shapes.
* Tape **one LED** to each paper leaf. Make sure the **metal legs of the LED stick out** so you can connect them later.

**Step 2: Plan Your Jungle Trail**

* Lay out the leaves in a **path or winding trail**—this could be across your desk, on the floor, or over a paper jungle map.
* Decide where your path starts (rescue base) and ends (safe zone).

**Step 3: Build the Light Circuit**

* Connect your battery holder to the first leaf using **foil strips or wire**—one strip to the longer leg of the LED (positive) and one to the shorter leg (negative).
* Keep connecting the leaves one after the other, forming a **series or parallel circuit**.
* Tape everything in place so the connections stay secure.

**Step 4: Test the Path!**

* Turn on the battery power (or plug in the holder). Watch as your “leaves” glow!
* Use your finger to “walk” through the jungle and follow the glowing path.

**Record & Reflect:**

**What’s happening to the energy in this circuit?**  
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
(Hint: How does electrical energy become light?)

**🚶 How does light help in dark, wild areas like a jungle?**  
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
(Hint: What could rescuers, animals, or explorers use the lights for?)

**Optional Challenge:**  
Can you make the lights blink or turn on **only when someone steps on the trail**? Add a switch or foil pressure plate to make it interactive!

What’s happening to the energy in this circuit?  
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How does light help in dark, wild areas?  
→ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

### 📍 **Station 4: Leaf Trail Light Path**

**NGSS Standard: 4-PS3-4**  
Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.  
→ In this activity, students apply scientific understanding of **energy conversion** (from **chemical energy in batteries** to **light energy** in LEDs) through circuit design in a jungle-themed scenario.

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

**STEL 1A** – The study of technology uses knowledge and skills from other subject areas.  
→ Students apply concepts from science (energy transformation), math (sequence, direction, layout), and art (leaf shapes and visual design).

**STEL 2A** – Technological systems are designed to meet needs and wants.  
→ The glowing leaf trail meets a safety or survival need by guiding explorers in the dark.

**STEL 3A** – Technological products and systems are shaped by cultural and environmental factors.  
→ Students design based on the jungle environment—leaf shapes and terrain-inspired paths.

**STEL 4A** – Break systems into parts to see how they work together.  
→ LEDs, wires, battery, and layout all work together in a system to create a functional light path.

**STEL 5A** – Technologies can be used to communicate or cause an effect.  
→ Light communicates a safe route or emergency path in a rescue scenario.

**STEL 6A** – Creativity and innovation improve technology.  
→ The optional challenge allows for creative upgrades like blinking lights or pressure-activated switches.

**STEL 7A** – The engineering design process helps people solve problems.  
→ Students plan, build, test, and reflect—classic engineering process steps.

**STEL 8A** – Design is a creative process for meeting needs and wants.  
→ The project encourages imaginative problem-solving with a real-world context.

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

**CCSS.MATH.CONTENT.3.MD.D.8** – Solve real world and mathematical problems involving perimeters of polygons.  
→ Students measure and design the “path” using lengths of foil or paper trail.

**CCSS.MATH.CONTENT.4.G.A.1** – Draw and identify lines and angles, and classify shapes by properties of their lines and angles.  
→ Optional tie-in as students lay out their light path geometrically or trace paths on maps.

**CCSS.MATH.CONTENT.4.MD.A.3** – Apply area and perimeter formulas for rectangles in real-world problems.  
→ Measuring the path or spacing LEDs could involve perimeter/area reasoning.

**CCSS.MATH.PRACTICE.MP2** – Reason abstractly and quantitatively.  
→ Students reason about voltage, number of lights, and layout structure.

**CCSS.MATH.PRACTICE.MP5** – Use appropriate tools strategically.  
→ Wires, LEDs, paper, and batteries are tools selected and used to solve a lighting challenge.

**CCSS.MATH.PRACTICE.MP7** – Look for and make use of structure.  
→ Understanding how a circuit must be laid out to function successfully requires pattern recognition and structural thinking.

### ✅ Summary

This hands-on jungle-themed circuit path integrates **science, technology, engineering, art, and math** (STEAM). It directly supports **NGSS 4-PS3-4**, aligns with **ITEEA STEL systems/design standards**, and meets **Common Core Math** goals in geometry, measurement, and problem-solving.