



Human circuit (6–12 players)

Type: Icebreaker (10–15 mins)

Overview

Learners form a closed loop with their bodies to act as a simple electrical circuit. By raising and lowering hands in sequence, they simulate the flow of current. A switch can break the loop, stopping the flow. A resistor reduces the “energy” passed through, shown by lowering hand height. A lamp lights up according to the height of the signal it receives, representing brightness. This physical game demonstrates how electricity only flows when a circuit is complete, and how components affect what happens in the loop.

Key concepts

- **Closed circuit:** Current flows only if the loop is complete
- **Switch:** Breaking the loop stops the current entirely
- **Resistor:** Reduces the current, so the lamp light becomes dimmer rather than slower to light up

Materials

- None required
- *Optional:* role cards or labels (battery, switch, lamp, resistor, wire)

Roles

- **Battery** – starts the circuit by raising their **left hand high** and calling “Zap!”
- **Wires** – the conductors. If your **right hand** is raised, immediately raise your **left hand** to the same height to pass the signal on.
- **Switch** – can open the circuit by unclasp hands, or close it again by holding on. If the switch is open, no current can flow.
- **Resistor (optional)** – when their right hand is raised, they raise their left hand only **part-way** (chest height, not overhead) to show energy being reduced.
- **Lamp** – when their right hand is raised, they raise both arms to the same height they received. High = bright. Lower = dim.



- **Observers (optional)** – check if the circuit completes correctly and report whether the lamp was “bright” or “dim.” If the lamp doesn’t light, explain where the circuit broke.

How to play

1. Learners stand in a **circle**, holding both hands with their neighbours (left to right). This is the “closed loop.”
2. All hands begin **down**.
3. The **battery** starts the current: raise your **left hand high** overhead.
4. When your **right hand** is lifted by the person on your right, raise your **left hand** to pass the signal forward (a bit like a stadium wave 🙌👏👏👏).
 - Match the **height** of the hand you received: if it was high, pass it high; if reduced, pass it reduced.
5. The wave continues around the loop until it reaches the **lamp**.
 - The lamp raises both arms to the incoming height: **high** = “**BRIGHT!**”, lower = “**DIM!**”.
6. The signal completes the loop and returns to the **battery**, who can start the next cycle.
7. If the **switch** opens (lets go of a hand), the loop is broken and no signal passes — the lamp stays off.
8. If a **resistor** is in the loop, the lamp will not reach full height: it lights dimmer.

Core lesson

“Electricity flows around a loop (circuit) almost instantly. If the circuit is broken, nothing works. Resistors are used in electronics to lower current (let less energy through the circuit). If a resistor is added, less energy reaches the lamp, so it glows dimmer. Add enough resistance and the lamp won’t work at all.”

Variations

- **Multiple resistors:** Place 2 resistors in the loop, each lowering the hand further. The lamp becomes very dim.
- **Noisy mode:** Try passing the wave by shouting “Zap!” at different volumes instead of holding hands, then compare to sound + movement. Which is clearer?
- **Parallel circuits (advanced):** Create 2 side-by-side loops with batteries feeding the same lamp. If 1 branch breaks, the other can still light it.