

Team Name: Example

Your Task

Assemble a circuit using the materials in front of you, **carbon paint and copper tape**, that follows the following constraints.

1. The circuit must light up **exactly 2 LEDs**
2. The circuit path must cover at least **20 squares** of distance
3. You need to generate **1 mW** of power @ 9 V
4. The circuit must fit within the board
5. You do not get any more materials

Your goal is to create a circuit that satisfies the constraints while having the least carbon cost.

Embodied Carbon

Choose one from the following:

1. Processing – *Converting raw materials into a form you can work with*
2. Manufacturing – *Turning processed materials into the final product*
3. Distribution – *Transporting materials from the factory to the user*

Materials Extraction

Material	Length (squares)	Cost (g/in.)	Subtotal
Carbon Paint	<u>0</u> sq.	6.5 g/sq.	<u>0</u> g CO ₂ e
Copper Tape	<u>20</u> sq.	50 g/sq.	<u>1000</u> g CO ₂ e
Total Cost			<u>1000</u> g CO ₂ e

Disposal – Estimated to be 20 g CO₂e

Embodied Carbon – Carbon Paint: 0 g CO₂e

Embodied Carbon – Copper Tape: 1000 g CO₂e

Operational Carbon – $0.45 * \underline{9} \text{ V}_{\text{battery}} * \underline{550} \text{ mAh}_{\text{battery}} = \underline{2227.5} \text{ g CO}_2\text{e}$

Total Carbon Cost = $(C_{\text{embodied}} + C_{\text{operational}}) = \underline{3227.5} \text{ g CO}_2\text{e}$