

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.

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### 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>20</u> sq.	6.5 g/sq.	<u>130</u> g CO <sub>2</sub> e
Copper Tape	<u>0</u> sq.	50 g/sq.	<u>0</u> g CO <sub>2</sub> e
<b>Total Cost</b>			<u>130</u> g CO <sub>2</sub> e

Disposal – Estimated to be 20 g CO<sub>2</sub>e

**Embodied Carbon – Carbon Paint:** 130 g CO<sub>2</sub>e

**Embodied Carbon – Copper Tape:** 0 g CO<sub>2</sub>e

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

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**Total Carbon Cost** =  $(C_{\text{embodied}} + C_{\text{operational}}) = \underline{2357.5} \text{ g CO}_2\text{e}$