Circle the tree you will be using for the CO2 calculations
What is AUP’s Carbon Footprint?

Directions: Calculate your school's carbon footprint by using the following steps below.

NEED TO KNOW!
1 kWh of energy produced from a coal powered electricity plant generates 1.33 kg of CO₂

\[ 1 \text{ kWh} = 1.33 \text{ kg CO}_2 \]

Step 1: The appliances in your school that use the most electricity are listed below. In order to calculate AUP's carbon footprint you will need to estimate:
1. The number of each appliance in your school
2. How long each appliance is in use per day

**Fluorescent Light Bulb:** 0.025 kW used each hour

\[ 0.025 \text{ kW} \times \text{_______} \times \text{_______ hr} \times 1.33 \text{ kg CO}_2 / \text{KWh} = \text{kg CO}_2/\text{day} \]

**Laptop Computer:** 0.09 kW used per hour

\[ 0.09 \text{ kW} \times \text{_______} \times \text{_______ hr} \times 1.33 \text{ kg CO}_2 / \text{KWh} = \text{kg CO}_2/\text{day} \]

**Air Conditioning:** 0.76 kWh used per hour

\[ 0.76 \text{ kWh} \times \text{_______} \times \text{_______ hr} \times 1.33 \text{ kg CO}_2 / \text{KWh} = \text{kg CO}_2/\text{day} \]

Part 2: Add the carbon production from all three appliances together to calculate AUP’s total CO₂ production.

Total CO₂ production from your school:

How much CO₂ is produced per year?

(given there are 365 days in one year)
**Step 1:** Calculate the Area of your tree using the Circumference (C):

\[ C = 2\pi r \]

We know that \( \pi = 3.14 \). Insert your value for C and re-arrange to solve for r. Then use that r value to calculate the Area of your tree using the formula:

\[ A = \pi r^2 \]

*Show your work here:*

**Step 2:** Calculate the Volume of your tree using Area (A) and Height (H)

\[ V = A \times H \]

Use the value for A you just calculated and Insert your value for H to solve for V

*Show your work here:*

**Step 3:** Calculate the Mass of your tree using Area (A) and Density (D)

\[ \text{Mass (M)} = A \times D \]

We will assume that the Density (D) of your tree is 700Kg/m³; a typical density for a tree. Use the values for A and D you just calculated to solve for mass.

*Show your work here:*

**Step 4:** Calculate the Amount of CO₂ sequestered by your tree

Trees use CO₂ and water in the air for Photosynthesis. It takes 6 molecules of CO₂ to make one molecule of sugar (tree food!). The ratio of the mass of CO₂ used to the mass of Sugar Produced is 1.5, therefore:

\[ \text{CO₂ sequestered} = 1.5 \times M \]

Use the value for M you just calculated to solve for CO₂ sequestered.

*Show your work here:*
Step 5: Calculate the TOTAL amount of CO₂ sequestered by the trees around AUP in one year

Use the map provided to count how many trees are around AUP

<table>
<thead>
<tr>
<th>Assumptions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assume each tree is the same size as the one you just completed calculations for.</td>
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<tr>
<td>• Assume each tree is 50 years old.</td>
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</tbody>
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<table>
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<tr>
<th>Show your Work Here:</th>
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<tr>
<th>Answer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kg CO₂ sequestered per Year</td>
</tr>
<tr>
<td>By trees around AUP</td>
</tr>
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Step 6: Conclusions:

ACCORDING TO YOUR DATA How does the amount of CO₂ produced by AUP compare to the amount of CO₂ sequestered in the trees? Is this what you expected to find? Explain.

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