

MATHS MISSION

Power Planner

 YOUR ROLE: ENERGY PLANNER **Your Mission**

The school hall has a high power bill. You've been asked to investigate whether installing solar panels would actually save money over time — and if so, how long it would take to pay off.

 Before You Begin

- Why might something with a big upfront cost still be a good investment?
- What information would you need before recommending a big purchase like this?

 **Talk with a partner: is solar worth it? What's your first guess?**

 Background

Solar power is increasingly common on remote buildings. While panels cost money upfront, they can reduce ongoing running costs significantly — but it takes time before the savings outweigh the initial cost.

 Step 1 – Monthly Savings

Current bill: \$240 per month. Estimated bill after solar: \$60 per month.

Work out the monthly saving, then express it as a percentage of the original bill.

- Monthly saving = $\$240 - \$60 = \$$ _____
- Percentage saved = $(\text{saving} \div \$240) \times 100 =$ _____%

 Step 2 – What Does a Point Mean?

A point on this graph is written like this: (Month, Total Cost So Far).

(0, 3600) means — Month 0, total cost so far is \$3600 for the Solar option. That's just the installation, before any bills.

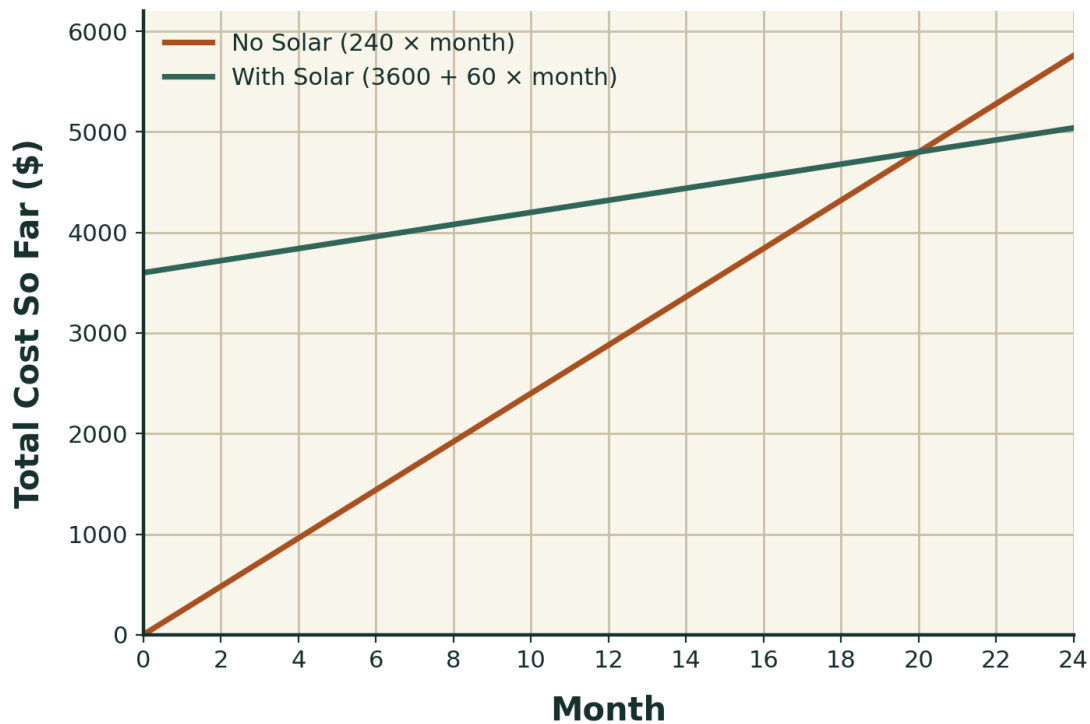
What do you think (0, 0) means for the No Solar option?: _____

 Step 3 – Read the Break-Even Graph

Below is a graph of both options over 24 months. The bottom axis shows the Month. The side axis shows the Total Cost So Far.

Find the point where the two lines cross.

Power Costs Over Time — Where Do the Lines Cross?



- At about which month do the lines cross?
- At that month, are the two totals about the same, or very different?

Compare the month you found with a partner.

Step 4 – Check Your Reading

Use multiplication to check a few points on each line, and confirm where they meet.

Month	No Solar ($240 \times \text{month}$)	With Solar ($3600 + 60 \times \text{month}$)
10	_____	_____
20	_____	_____
24	_____	_____

- Which month has matching (or almost matching) totals? Does it match what you read from the graph?

Make a Decision

Should the school hall install solar panels?

- ☐ Yes, install solar
- ☐ No, don't install solar
- ☐ It depends — explain

Explain your decision using the break-even point from your graph and table.

: _____

: _____

Mission Challenge

A grant would cover half of the \$3600 installation cost, bringing it down to \$1800.

The monthly saving stays the same. Work out the new break-even month.

Install Cost	Monthly Saving	Break-even Month
\$3600	\$180	20 (from your graph)
\$1800	\$180	_____

Does the grant change your recommendation? Explain.

: _____

★ Extension Challenge

Write a rule for the total cost with solar after any number of months.

What is your rule?

💡 *Talk with a partner before you write your rule.*

My idea: _____

🌐 Community Connection

Energy costs matter to buildings and homes across many communities, not just schools.

- Solar panels
- Diesel generators
- Water pumps or bore power
- Firewood or heating costs

What energy costs or projects matter to a building or home you know?

: _____

💬 Reflection

Circle how you felt about today's mission:

😊 Confident 😊 Mostly understood 😐 Needed some help 😞 Found it difficult

What did the graph show you that the numbers alone didn't?

: _____

★ Bonus Challenge

Write one recommendation to the school about the solar decision, using your numbers as evidence.

: _____

: _____