

Essential Skills Wales

Essential Application of Number Skills (EAoNS)

Level 2 Controlled Task

Candidate Pack

Solar Panels

Version 2.3

Sample (Set B)

Instructions

- Fill in the candidate information boxes below.
- Complete **all** parts of the task.
- Sign and date the declaration on the next page when you have completed the task.

Candidate name:
Candidate number:
Date registered for EAoNS:
Unique Learner Number (ULN) (<i>if applicable</i>):
Centre name or number:

You have up to **5 hours in total** to complete this controlled task.

The total time can be split over a number of sessions.

Details of when each session started and ended **must** be recorded below:

Date controlled task started :							
Date controlled task completed (<i>no more than eight weeks later</i>):							
Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Session 8
	<i>Date</i>	<i>Date</i>	<i>Date</i>	<i>Date</i>	<i>Date</i>	<i>Date</i>	<i>Date</i>
<i>Duration</i>	<i>Duration</i>	<i>Duration</i>	<i>Duration</i>	<i>Duration</i>	<i>Duration</i>	<i>Duration</i>	<i>Duration</i>
Total time spent:				Supervisor signature:			

If more than eight sessions are required, any further dates/durations should be recorded on a separate sheet.

Produced jointly by the four Essential Skills awarding bodies:

Agored Cymru
City & Guilds
Pearson
WJEC



This task pack contains a scenario, a set of instructions and source material.

- Read the scenario, instructions and source material carefully before you start.
- You will be supervised throughout your time working on this task.
- You can use most of the equipment normally available to you in a real-life situation, including internet access.
- All work submitted must be **entirely** your own. You are not allowed any help with the skills that are being assessed through this controlled task.
- Hand in all of your work at the end of **each** session. You are not allowed to take any task materials away with you, or have access to these between sessions.
- Sign and date the declaration below when you have completed the task.

Candidate declaration

I confirm that this controlled task is entirely my own work and it was completed during the supervised sessions stated on the front page.

Candidate signature: _____ Date: _____

Task instructions: Solar Panels

What you need to find out

Scenario

Some friends have asked for advice about having solar panels installed on their roof. They want to use some of the electricity from the solar panels and sell the rest.

The aims of this task are to:

- calculate the total cost of the electricity your friends used last year
- calculate the total annual savings and income they can make from the solar panels
- calculate the total cost of the solar panels
- recommend whether your friends should have solar panels or not and give a reason.

Use the sources provided.

What you need to do

Part 1

Read through the task and source materials.

Make a detailed plan to show how you will do this task.

Show your plan as a list, a table, a spider diagram or a flow chart.

You must include:

- the information you will use from the source materials
- the calculations you will do
- the reason(s) for your choice of **at least one** of your calculations
- how you will present your findings for Part 2 and Part 3.

(Total for Part 1: 3 marks)

In **Part 2 and Part 3**, you must:

- show all the calculations you do. If you use a calculator, make a note of what you put into the calculator. If you use a spreadsheet, make a note of the numbers and the formulas you use
- give your answers to a suitable level of accuracy.

Remember to check your calculations.

Part 2

Your friends need to know how their electricity usage compares with the usage of the average UK consumer.

You must:

- calculate the total amount of electricity used last year by:
 - your friends
 - the average UK consumer
- calculate the total cost of the electricity used last year including VAT for:
 - your friends
 - the average UK consumer
- present your findings in a suitable way (complex table, diagram, line graph comparative/component bar chart or pie chart)
- compare your answers and make **at least one** comment on your findings.

Remember to check your calculations.

(Total for Part 2: 9 marks)

Part 3

Your friends want to have the maximum number of solar panels that will fit in the available space. They need to know how much money they can make each year from the solar panels.

You must:

- calculate the maximum number of solar panels that will fit in the available space
- calculate the total amount of electricity the solar panels will generate in a year
- calculate the total annual savings and income your friends can make from the solar panels
- present your findings in a suitable way (table, diagram, line graph, bar chart or pie chart). Use a different method to the one you used in Part 2.
- compare the total annual savings and income from the solar panels with the total cost of the electricity your friends used last year (from Part 2).
Make **at least one** comment on your findings.

You must:

- calculate an estimate of the total cost of the solar panels
- recommend whether your friends should have the solar panels or not.
Give **at least one** reason.

Remember to check your calculations.

(Total for Part 3: 15 marks)

Sources you should use

Source 1

- Chart – electricity usage last year

Source 2

- Diagram – available space for solar panels

Source 3

- Diagram – solar panel

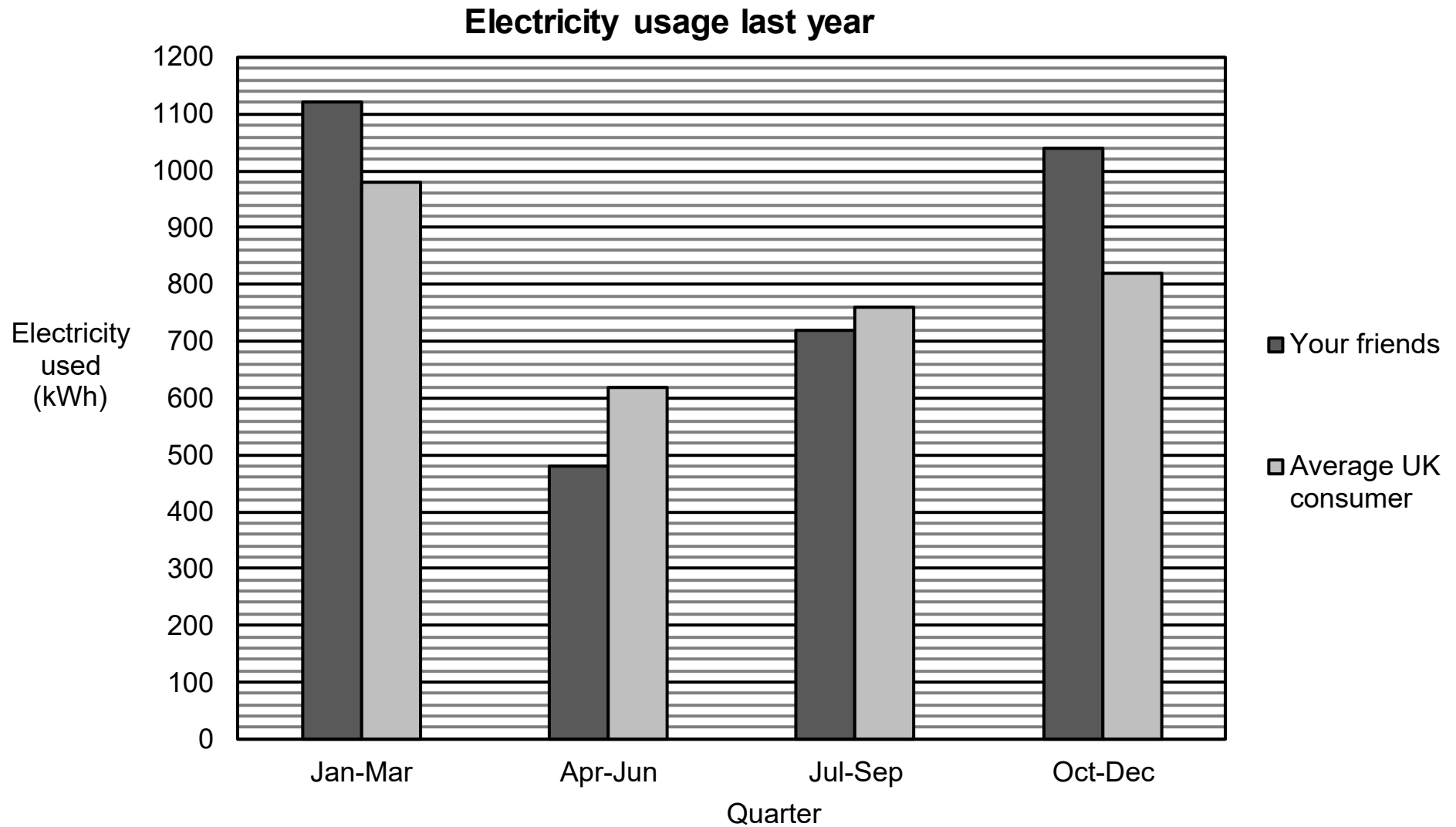
Source 4

- Formula – total annual savings and income from solar panels

Source 5

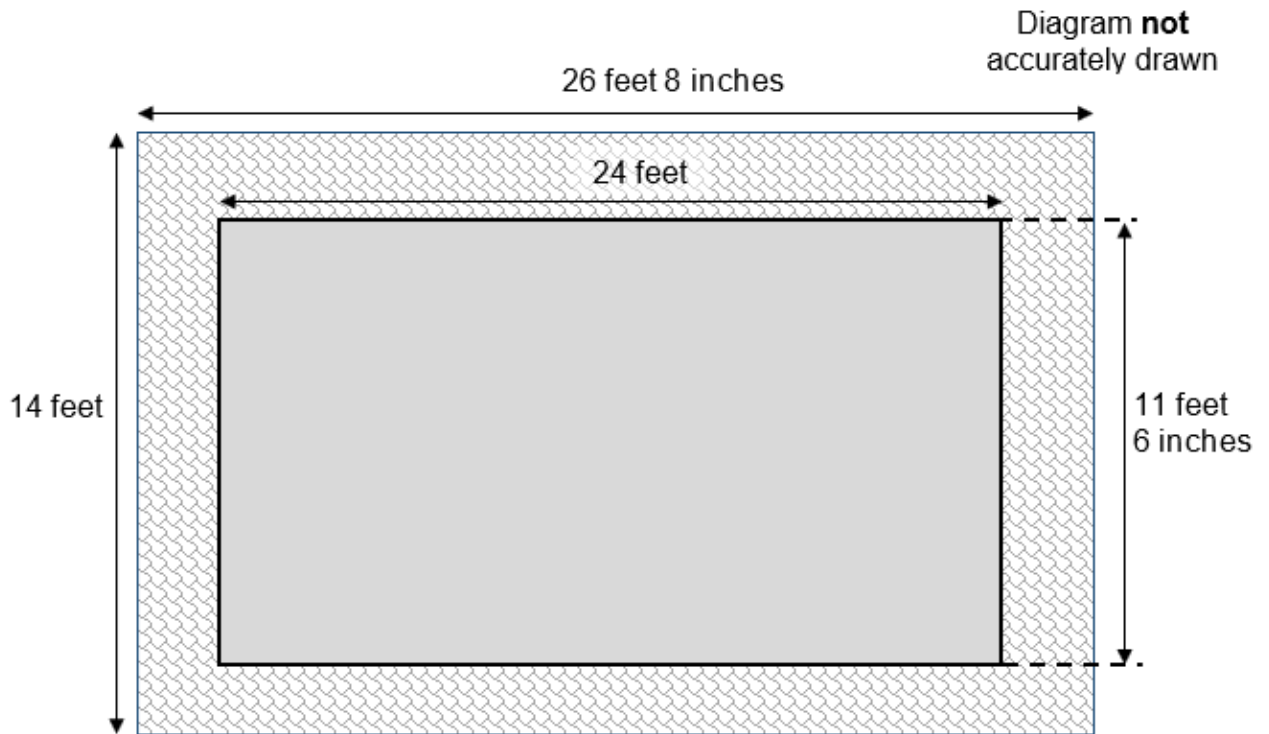
- Table – cost of solar panels

Source 1 Chart – electricity usage last year



Cost per unit (kWh) of electricity used is 16.37p plus 5% VAT.

Source 2 Diagram – available space for solar panels



Key



Roof of house



Available space for solar panels

Conversion rates

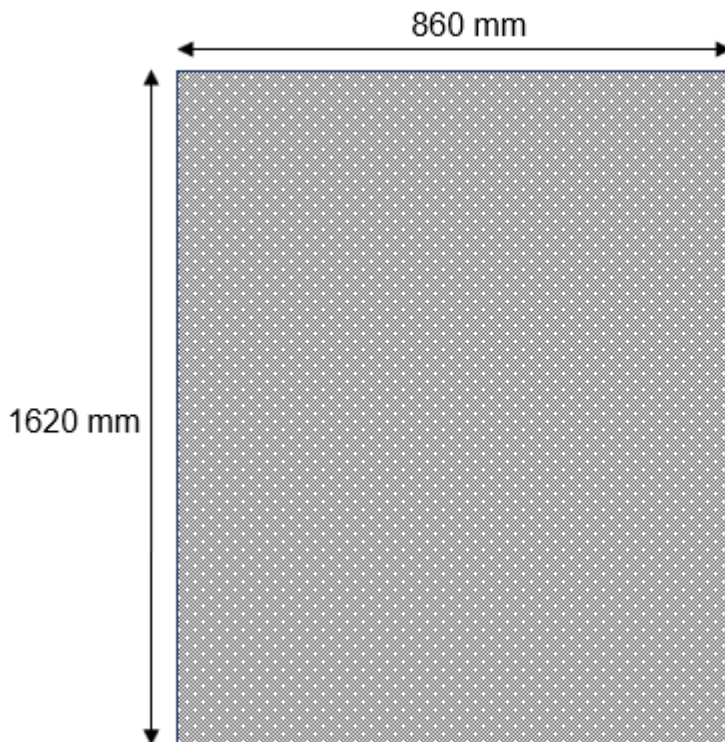
12 inches = 1 foot

1 inch = 2.5 cm

1 foot = 30 cm

Source 3 Diagram – solar panel

Diagram **not**
accurately drawn



Information about solar panels

Each solar panel has a rating of 0.25 kWp.
This is the rate at which it generates electricity at peak performance.

A solar panel system of 1 kWp will generate 850 units (kWh) of electricity per year.

Source 4 Formula – total annual savings and income from solar panels

Information for customers

You can save money by using electricity from your solar panels.
You can also earn money from the electricity you sell.

Use this formula to work out the total annual savings and income.

$$t = \frac{e}{100} \left(2.5 + \frac{u}{2} \right)$$

where t = total annual savings and income in pounds (£)

e = total electricity generated per year by the solar panels (kWh) (Source 3)

u = cost per unit of electricity from your current supplier without VAT (pence) (Source 1)

Source 5 Table – cost of solar panels

Total rating (kWp)	Estimated total cost (£)	CO ₂ saved per year (tonnes)
up to 1.5	2 000 – 3 500	0.26
1.5 to 2.5	3 500 – 5 000	0.51
2.5 to 3.5	5 000 – 6 500	0.77
3.5 to 4.5	6 500 – 8 000	1.14
4.5 to 5.5	8 000 – 9 500	1.38