

Summer Solar Academy 2016

Written Formative Assessment #1

1. In your own words, using full sentences, explain the benefits of providing solar suitcases to youth in Kenya (5 points)
2. What is the PV effect? You can use a diagram in your answer (5 points)
3. What are the variables that influence how much electricity is produced by a solar cell? (5 points)

4. Choose one of the variables from #3 and explain how you could set up an investigation to explore how this affects the amount of electricity produced. (15 points)

The independent variable I have chosen is:

I will change this variable by:

The dependent variable I will measure is: unit_____

The control variables I will keep the same are:

Describe your procedure (use bullet points):

The results I would expect to see are (if you can, sketch a graph):

5. Using a model of your choice, explain what is meant by (10 points):
- a. Voltage
 - b. Current
 - c. Power
 - d. Energy
6. Draw two circuits, one with series wiring and one with parallel wiring. Explain the differences between them. (5 points)

Use these equations to answer question 7.

P = Power	Units: watts or joules/sec	$P = IV$
I = Current	Units: amps	$I = P/V$
V = Volts	Units: volts	$V = P/I$
E = Electrical Energy	Units: watt*time	$E = Pt$

R = Resistance	Units: ohms	$R = V/I$
I = Current	Units: amps	$I = V/R$
V = Electric Potential	Units: volts	$V = IR$

7. At the school in Kenya where the solar suitcases are going, the girls want to charge an e-reader. This needs 3W of power for 2 hours. (15 points)
- a. What current is needed to get this amount of power if the voltage from the suitcase is 12V? Show your work:

Answer:

Unit:

- b. Using your answer from part a., calculate the resistance that must be present in the circuit. Show your work:

Answer:

Unit:

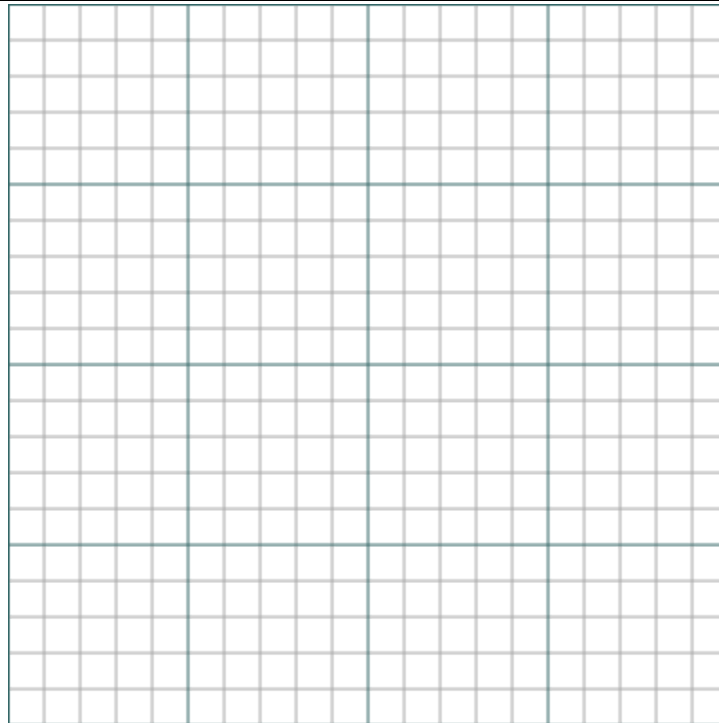
- c. How much energy does charging the e-reader take? Show your work:

Answer:

Unit:

8. Plot this data on the graph below. Be sure to include: (15 points)
- labelled axis
 - correctly labelled intervals on each axis

Voltage (x-axis)	0	2	4	6	8	10
Current (y-axis)	0	1	2	3	4	5



- What is the gradient of this line?
- What is the equation of this line?
- What equation from the previous page relates to this graph?
- What electrical value does the gradient represent?