



In Schools

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PV Lesson Plan 2 – Sample Questions & Answers



Prepared for the Oregon Million Solar Roofs Coalition

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Sample questions to check your understanding:

1. The typical voltage of a silicon solar cell is about 0.5 volts; where does this voltage originate?
2. Given solar cells that each produce 0.5 V, how do you obtain the higher voltages needed to run your appliances?
3. To operate an appliance you usually need more current (amps) than a single PV cell produces; so how can you get the amperage that you need?
4. You want to run your small CD player that requires 17 Watts. If you have a 12% efficient PV array operating about noon on a sunny day, how much area would be involved in producing that much electricity?
5. Homes with PV arrays that are connected to the power grid use a device called an “inverter”. What does this device do?

Suggested answers:

1. This is the voltage that results at the n-p boundary from the electron configurations.
2. Solar cells, like batteries, can be arrayed in series (+ end to - end) thereby adding their voltages together.
3. You would combine the solar cells in parallel to build up the amperage you desire.
4. $1000 \text{ Watts/m}^2 \times 0.12 \times \text{area} = 17 \text{ Watts}$
 - a. $\text{area} = 0.14 \text{ m}^2$ or a square about 40 cm on each side.
5. The inverter must change the d.c. output of the solar cells to a.c. (alternating current) to be compatible with the grid. Modern inverters also keep the arrays operating near their maximum power point.