

Description

- Purpose: To make a hydroponics system that runs off solar energy
- Scale: Big enough for the 18 plants, for small back yards, small families or couples
- Specifications:
 - *Continuous Flow System* vs. Ebb and Flow (Flood) System vs. Drip System
 - Circulation flow rate of 1.5 to 2.5 gpm or 90 to 150 gph (www.easyhydroponics.net)
 - Be able to circulate the water with up to three days without sun

Calculations

Solar Panel:

Load = 170 gph (with head of 4.5 ft = 130 gph gives 2.1 gpm)
~ uses 22 Watts = 528 Wh per day

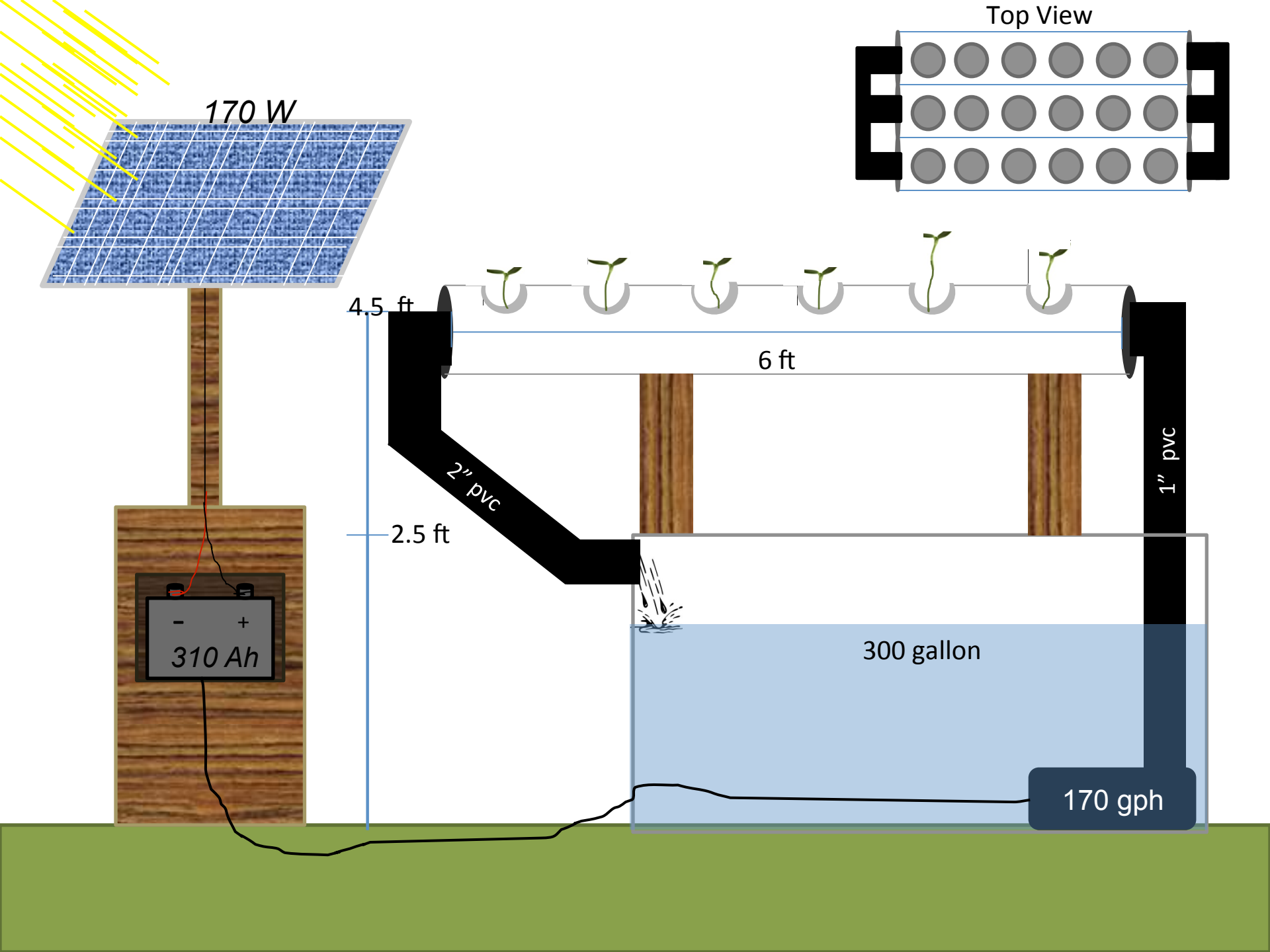
$$\frac{528 \text{ Wh}}{(4.5 \text{ PSH})(0.7)} = 167.6 \text{ Wpeak}$$

Battery:

528 Wh per day, with 3 days = (1584 Wh) (2) = 3168 Wh

50%
Discharge

$$\frac{3168 \text{ Wh}}{0.85} = 3727.06 \text{ Wh} \rightarrow \frac{3727.06 \text{ Wh}}{12 \text{ Volts}} \equiv 310 \text{ Ah}$$



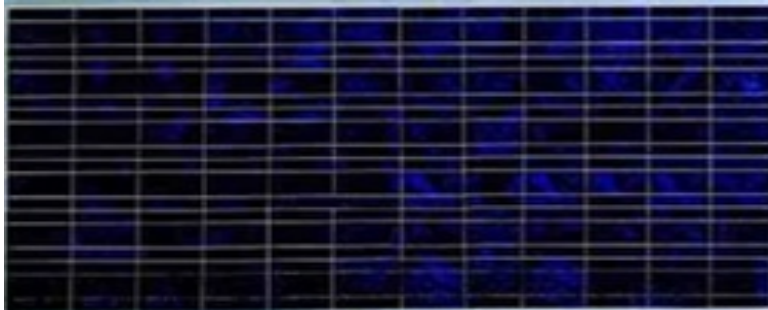
Budgeting



42"

63"

- | Description | Expense |
|--|---------------------|
| • Snyder 300 gallon water tank (63"x 42"x 30") | \$ 350.00 |
| • Little Giant 170 gph, 115 V, 22 W, 0.6 A Pump | \$ 136.95 |
| • Sharp 170 W Solar Panel (32.5"x 62"x 2") | \$ 472.25 |
| • Trojan Battery L-16PO, 390 Amphour | \$ 145.56 |
| • Expanded Clay <i>Pebble Hydroponic</i> Grow Rock | \$ 9.95 |
| • Electrical wire | \$ 15 (approx) |
| • 24 ft of 6" PVC pipe | \$ 160.56 (6.69/ft) |
| • 4.5 ft of 1" PVC pipe | \$ 2.93 (0.65/ft) |
| • 3 ft of 2" PVC pipe | \$ 3.90 (1.30/ft) |
| • 2, 45 ° 2" PVC pipe fitting | \$ 2.78 (1.39 ea) |
| • 1, 90° 1" PVC pipe fitting | \$ 1.30 |
| • 1, 90 ° 2" PVC pipe fitting | \$ 3.81 |
| • Wood base and 3 2x6 | \$ 50 (approx) |
| • Hardware | \$ 25 (approx) |



Approximate Total = \$ 1,370

Sources:

<http://www.easyhydroponics.net/contact.html>

http://www.hydroponics.net/learn/hydroponic_gardening_for_beginners.asp

Douglas, James S. Hydroponics. 5th ed. Bombay: Oxford UP, 1975. 1-10.

Turner, Bambi. "How Hydroponics Works." 20 October 2008. HowStuffWorks.com.
<<http://home.howstuffworks.com/hydroponics.htm>> 03 March 2011.

Sorenson, Dan. "Pampered tomatoes." Arizona daily star 23 April 2006.

