

# Irrigation System

## Description:

Students will learn about why we need the irrigation system in our garden. They can also learn about our solar energy, controls, pumps, and distribution system.

*Recommended Grade Level:*

**3-5**

*Season:*

**All**

**Outdoor**

## Background:

- The solar energy panels, pump system and irrigation piping and drip tubing was installed as part of Eagle Scout Project.
- The solar system includes
  - 2 X100 watt panels, a controller (modulates electric to 12 volts) , 2 -12 volt batteries, and a timer.
- The pump system includes
  - 4 – 5GPM diaphragm pumps
- The irrigation system includes
  - 1000 feet of PVC pipe running Underground to each of the 12 producing beds
  - Approximately 100 feet of Netafim drip (.9GPH) tubing in each producing bed.
- Mulch: We cover each our raised bed with about 3-4 inches of hay mulch .

## Materials:

Instructor – Lesson Plan and **walking tour of**

- Solar panels
- Solar Panel Controller
- Irrigation Pumps
- Drip irrigation system in each bed
- Mulch

## Preparation:

Contact the garden volunteers to unlock the solar box and pump box for lesson at [doloreswe@comcast.net](mailto:doloreswe@comcast.net) or visit the garden on Tuesday mornings between 9 and 10:30am.

## Activity:

Gather your students and take them on a walking tour of the Community Garden, pointing out the solar panels, solar panel controller, irrigation pumps, drip irrigation system in each bed, and mulch. The solar

box and pump box will be locked unless one of the garden volunteers are present. While touring ask the following questions:

- Drip irrigation system
  - What is a drip irrigation system?
    - When the irrigation pump runs the drip tube drips water at a controlled volume ( 9 gallons per hour).
  - Why use a drip irrigation system?
    - Drip irrigation system when installed under mulch loses very little moisture to evaporation compared to spray systems. Therefore, the plants get more water.

### **Tying It Together:**

- Irrigation Pumps
  - How do the pumps come on and how long?
    - A timer and 30 minutes won't drain the battery completely of power.
  - Why do we have 4 pumps and only 1 in service.
    - More reliability. Always one available.
- Mulch
  - Why do you have mulch?
    - Mulch protects the garden bed for losing moisture. In Houston 6 months of warm weather mulch reduces the chance of plants drying out and dying .
    - Mulch also reduces the chance of weeds growing by reducing light to the weed plant at soil level.

### **Digging Deeper:**

- Solar System
  - Why do we use solar panels in the garden (See Lesson Plan on Solar Panels-Sign 5)
    - To supply pumps with power. We have no other power supply
  - Why is the solar panel in this position.
    - Due south at a approx. 35 degree is the optimum position for maximum sun in our location.
  - How do you get power at your house and why?
    - Electrical supply has been more cost effective than solar panels in the past.
  - Could you run your house on solar panels
    - Probably. Needs to be studied.
- Solar Panel Controller.
  - Why do you think there is a solar panel controller
    - Hint. The changing angle of the sun on the panel produces different voltages coming from the panel
    - It regulates the voltage going to the 12-volt batteries. The 12 volt battery is where the pumps draws the power!

**Links:** <https://www.thespruce.com/drip-irrigation-systems-guide-5215166>

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