

How to Create Classroom Grow-Light Systems

Master Gardeners in Mathews, Va., regularly spend time in the classroom, teaching local fourth graders basic botany, the plant life cycle, and germination.

One-tier grow lights, one for each classroom, significantly help the process, said program coordinator Bev Holmberg.

She shared how the Master Gardeners create low-cost, easy-to-transport grow light systems for use in schools (following are instructions from *Garden Gate* magazine that Mathews Master Gardeners find particularly useful):

We use standard shop light fixtures (\$10 at Home Depot) and add two 40 watt 48-inch blue lights (\$2.50 each). The full-spectrum lights are not needed for the short time the plants are under them. A timer is needed to keep the lights on for 16 hours a day.

The lights need to be hung between two and four inches from the tops of the plants. We use “s” hooks to hold the chains so the lights can be raised as the plants grow. The children have a spray bottle with water and take turns misting the plants.

We do take a week or more to harden off the plants before planting them in the soil. The children carry the trays with the pots outside in the morning and put them under a tree and bring them in before school is out. This is a rough period if the weather does not cooperate.

After the plants are in the ground in the garden at the edge of the playground, the light rack disassembles and is easy to store. We do not glue the PVC pipes together.

The Mathews Master Gardeners have a long history of working with schoolchildren, both in the classroom and after school.

Hardening off

Sun schedule

Day	Hrs.	To harden-off
1	4	seedlings grown
2	4	indoors under
3	4.5	lights, take
4	4.5	them outside a
5	5	little longer
6	5	each day,
7	5.5	following this
8	5.5	schedule, which
9	6	starts with four
10	6.5	hours of sun
11	7	and ends two
12	7.5	weeks later
13	8	with a full day.



▲ **Big but tender** from growing under lights, these seedlings need hardening-off before they'll endure full sun. Take them outside a little longer each day, by the schedule at left.

I grow seedlings under a shoplight, the kind with a reflector and two 4 ft.-long fluorescent tubes. Fluorescent light is weak compared to sunlight, so plug the shoplight into a timer and give the seedlings 18 hours of light and 6 hours of darkness every day. Also, keep the tubes within 2 in. of the plants so the leaves get as much light as possible. I've made a lightstand that lets me hang shoplights from their chains and adjust their height (see below).

When spring arrives, the seedlings are too tender to go straight into the garden. They need hardening-off—a little more sun every day for two weeks (see the table at left). Otherwise, their leaves may scald from too much sun or wind. When you harden-off your seedlings, watch the pots closely. Outdoors, potting mix dries out much faster than indoors.

Making a light stand

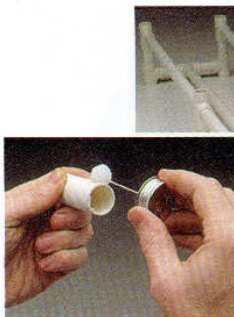
Here's a stand that will help you start seeds in late winter and grow the seedlings under lights until they're ready for the garden. It holds four flats of seedlings like the one at the top of this page and two fluorescent shop lights that are suspended from chains so you can change their height as the seedlings grow.

All you need to build the stand is a hacksaw, PVC glue, PVC glue, and about \$30 worth of 3/4 in. PVC plumbing pipe and fittings (see the bill of materials at bottom right). The vertical pipes are not glued so the stand can be dismantled and stowed in a small space.

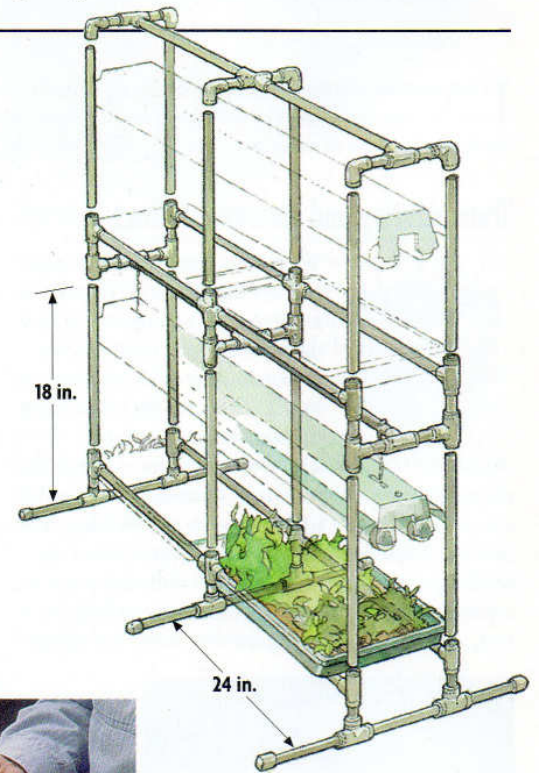
1 **Cut and assemble** the stand, starting with the bottom section shown here. Two screws in a board help hold the pipe as you cut (inset).



2 **Glue each section** with PVC glue spread on pipe and fittings. Do not glue the long vertical pipes between sections.



3 **Set up the stand** by inserting the long vertical pipes into the bottom and middle sections, then adding the top.



Bill of 3/4 in. PVC materials

- Cap
- T
- 4-way
- L
- 3"
- 7"
- 18"
- 24"

The lightstand takes 6 caps, 24 Ts, 6 four-ways, 6 Ls, 24 3-in. sections, 9 7-in. sections, 12 18-in. sections and 12 24-in. sections.