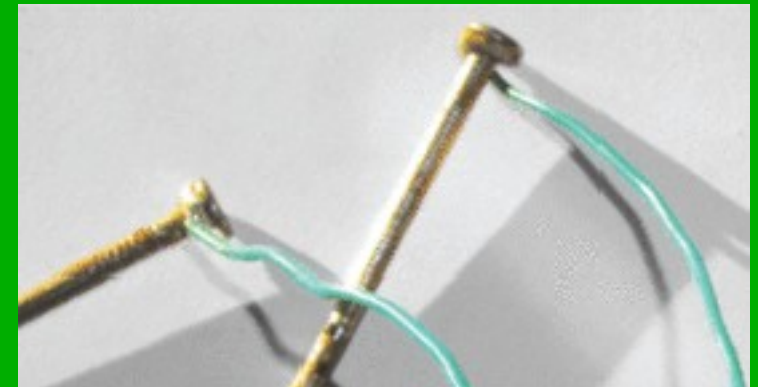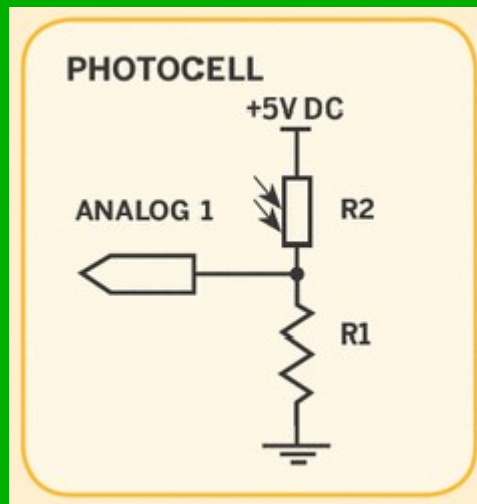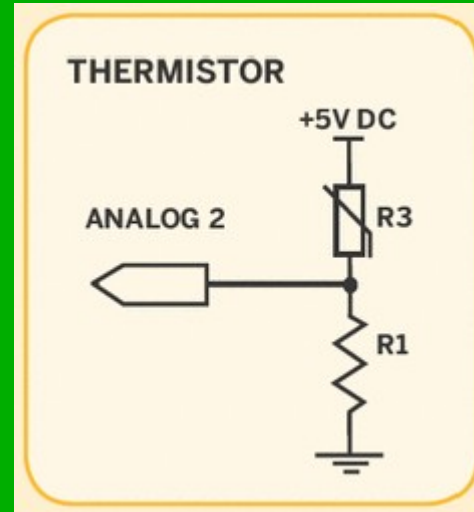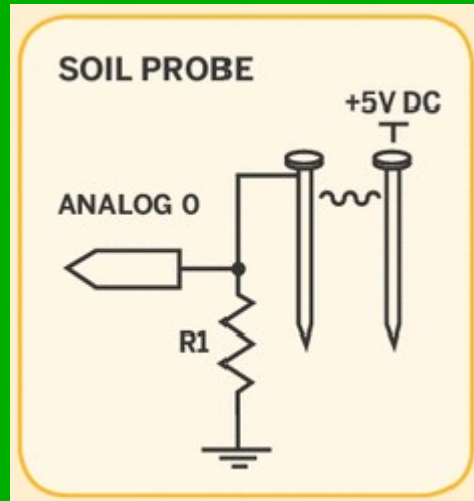# Geeked-Out Gardening

Garduino and Beyond

Luke Iseman
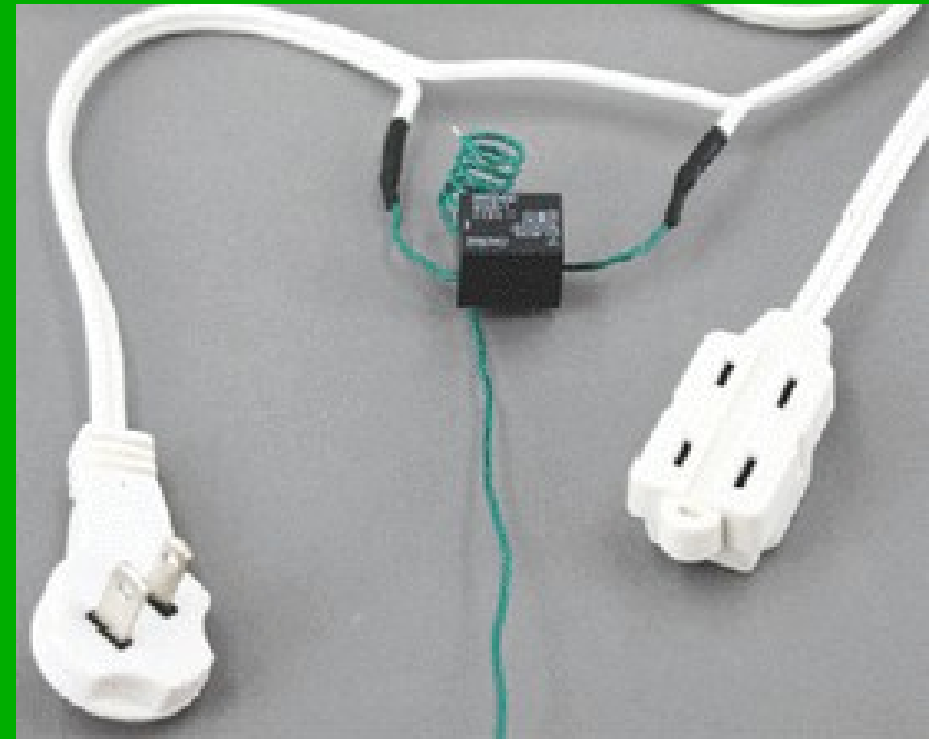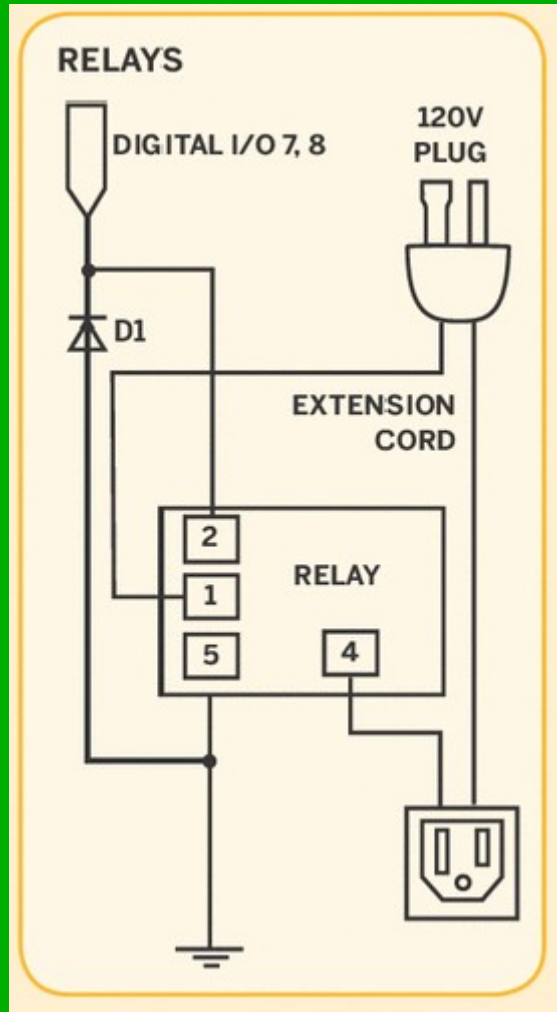
What's Garduino?

The Trick

Measure (and respond) to anything!

The Muscles

From .2 watts to 1200 watts, and AC

Now a Kit
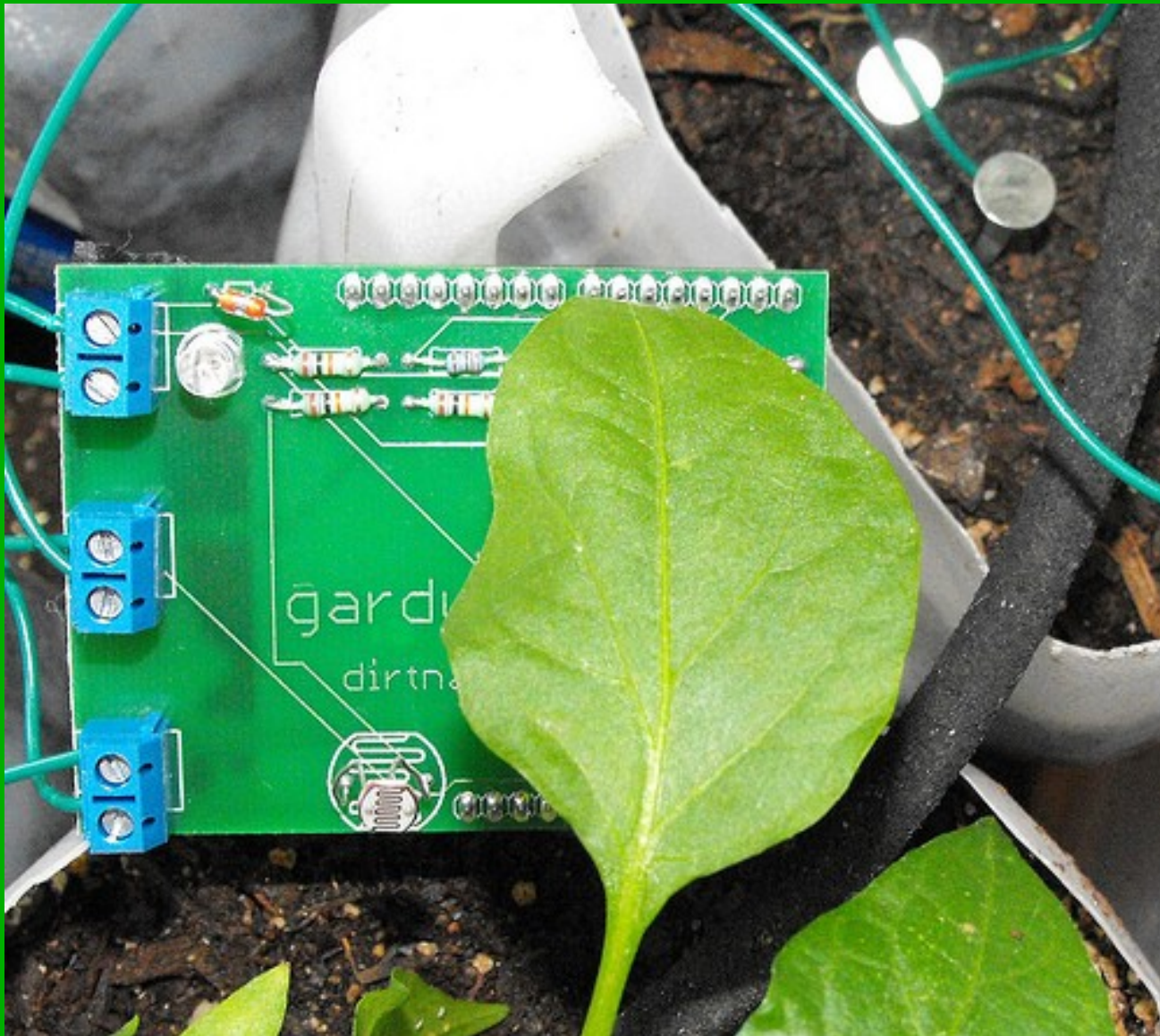
And Off-Grid
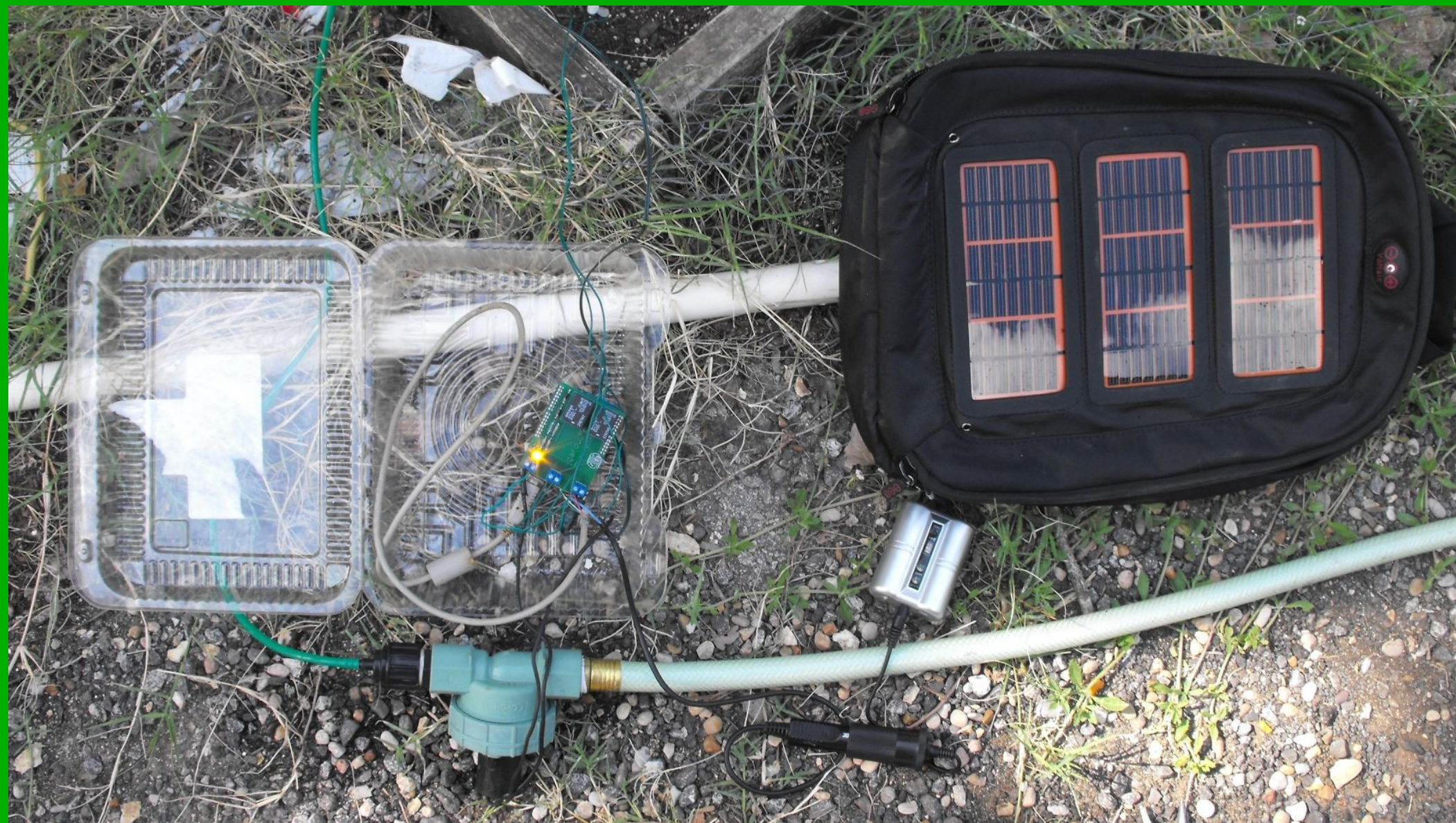
Why? Carbon
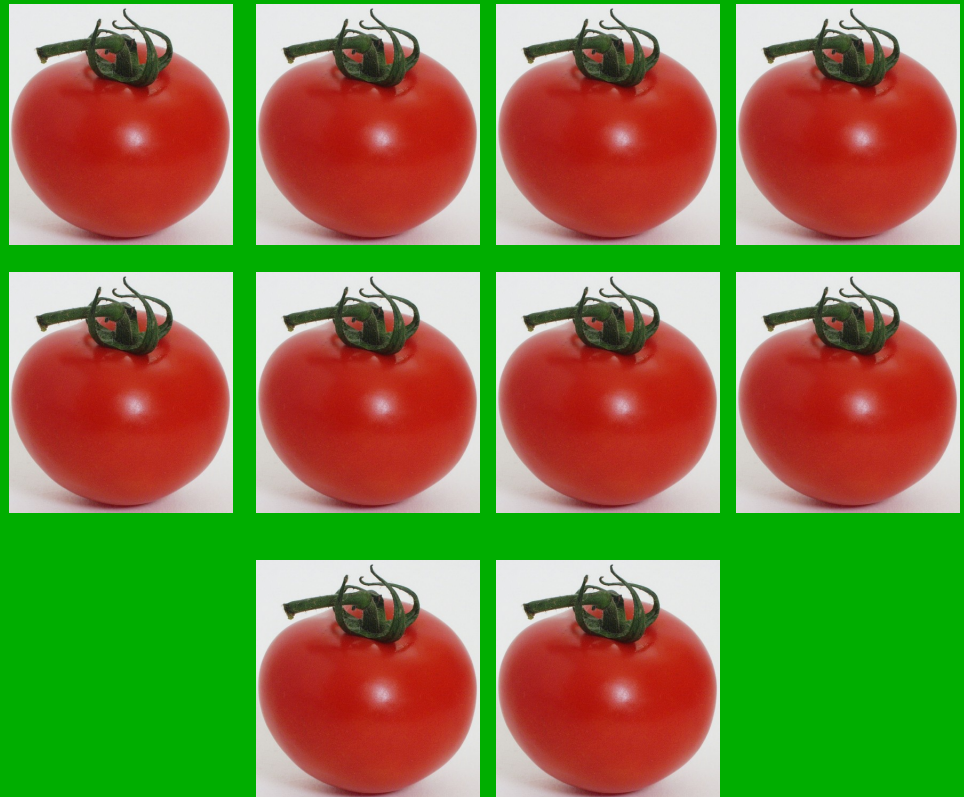
Why? Fairness

Actual split of income

3p — Growers

9p — Shipping, importing & packaging

6p — Wholesaler

3p — WIBDC

9p — Retailer

30p

(This activity is adapted from *Go Bananas,* Oxfam 2000)

Farm value	Marketing bill												
	Labor	Packaging	Transportation	Energy	Profits	Advertising	Depreciation	Rent	Interest	Repairs	Business taxes	Other costs	
19.0¢	38.0¢	8.0¢	4.0¢	3.5¢	4.5¢	4.0¢	3.5¢	4.0¢	2.5¢	1.5¢	3.5¢	4.0¢	

Source: USDA's Economic Research Service.
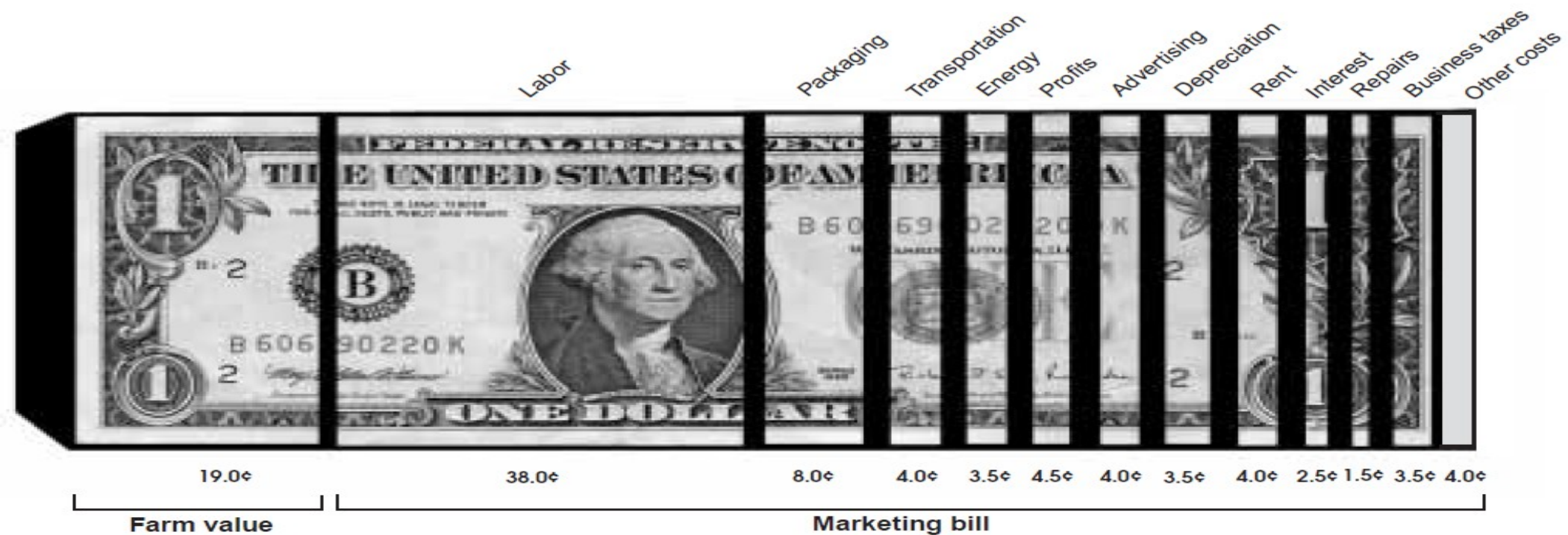
Why? Waste

Why? Fun!

"All that is very well," answered Candide, "but let us cultivate our garden."

Scalable?

Skill
Light
Water
Nutrients
Space
Time

Scalable!

- ~~Skill~~
  - Farmers *(=YOU)* + Instructables + Arduinos
- Light
  - Monitoring
  - Efficient Supplements
- Water
  - Rainwater
  - Greywater
- Nutrients
  - Compost
  - Human Waste
- Space
  - Empty Lots
  - Food Forests
- Time
  - Ignore Seasons
  - Grow Faster

Light: Monitoring
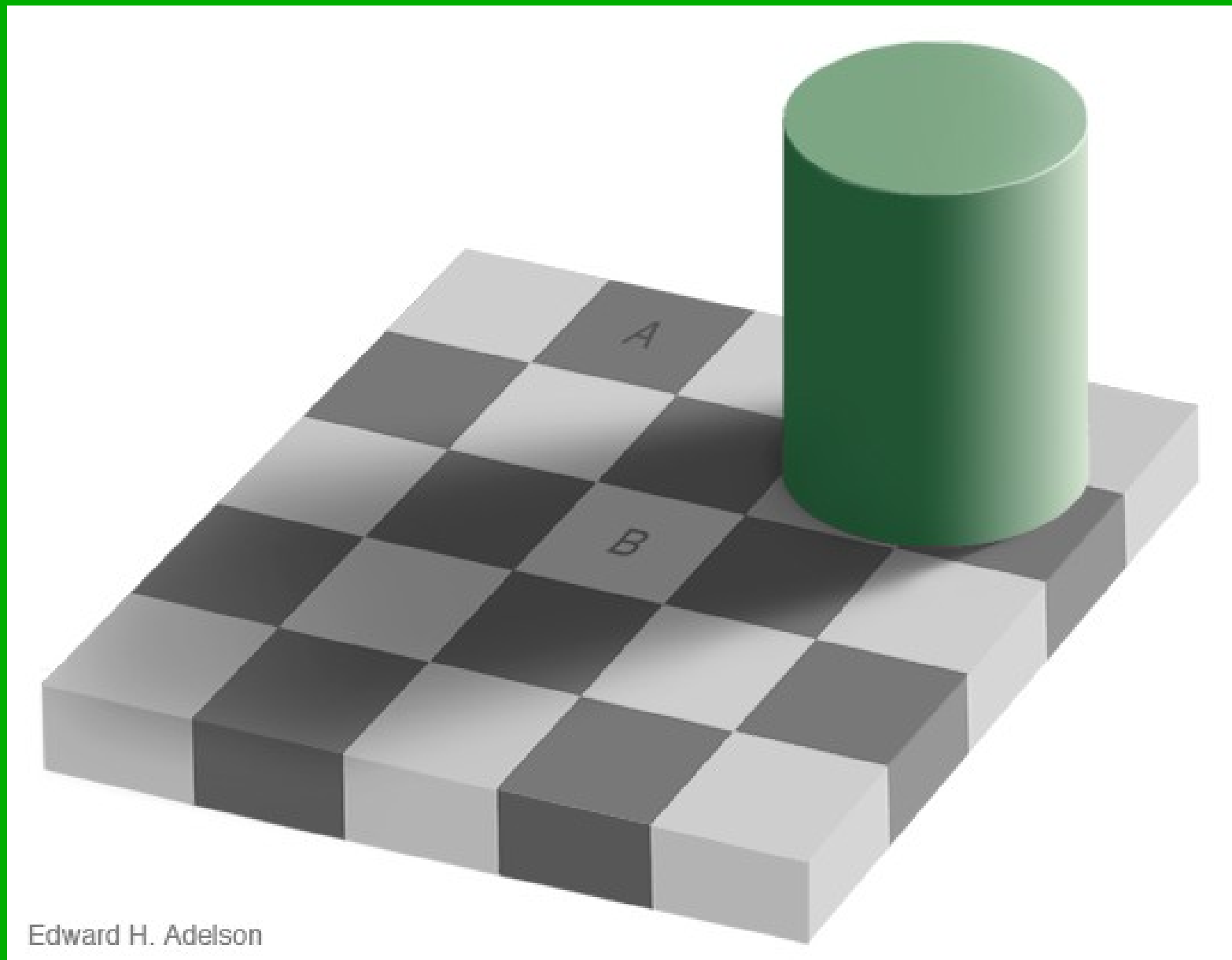
Edward H. Adelson

Checkershadow Illusion

Light: Monitoring

Plant light intensity meter

Light: Efficient Supplements
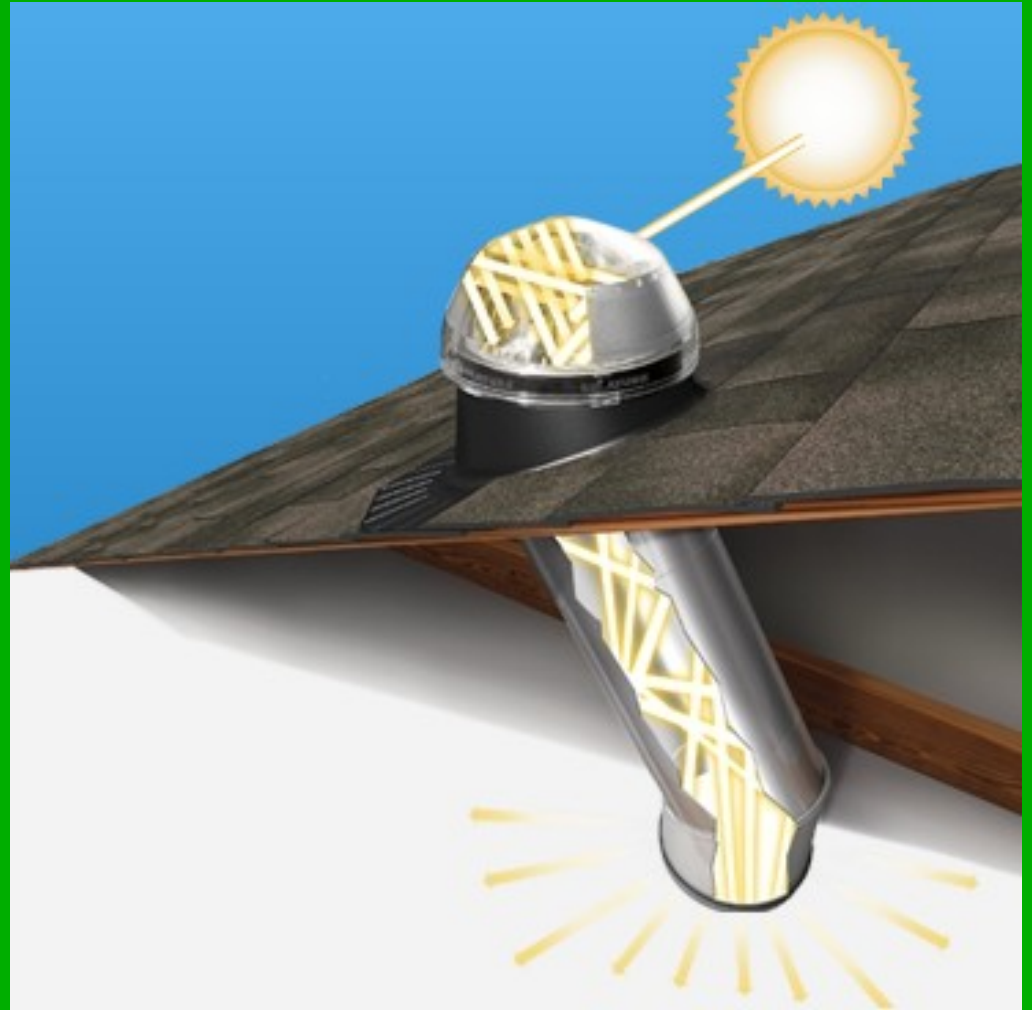
Solatube

Light: Efficient Supplements
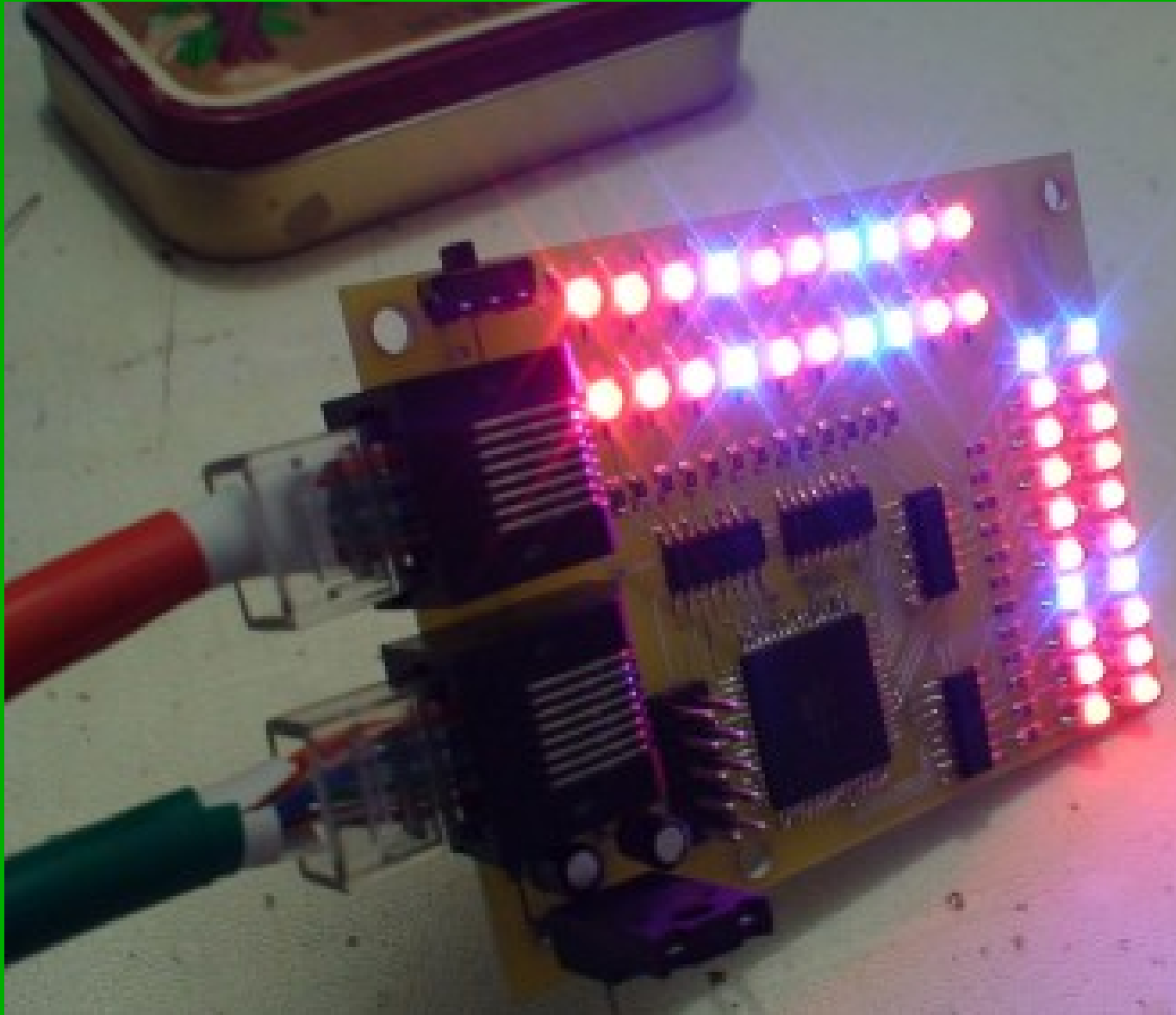
Mikey sklar sept

Sunduino?

Pulse LEDs of the proper color

Supplement light time <u>and intensity</u> to optimum per plant species

Record and share results of different lighting treatments

Water: Rainwater

1 inch rain on 1000sqft roof = 623 gallons

Instructables Rain Barrels

Water: Rainwater

1600 liters (422 gallons), ~$60
rain-jar handbook

Water: Greywater

Instructables: A Garden Shower in ten minutes and less than 8$

Water: Greywater

(ELEVATION VIEW)

Vent through roof

1½" pipe

Shower vent

Vents tied together 12" (30 cm) above spill point of highest fixture

2" pipe

Sink vent

Toilet vent

Cleanout

Sink waste, shower vertical wet vent (not allowed in some areas)

Always divert greywater downstream from vents

Concrete slab

Cleanout

Septic/sewer

Sand

Garden

No-hub connectors

3-way diverter valve
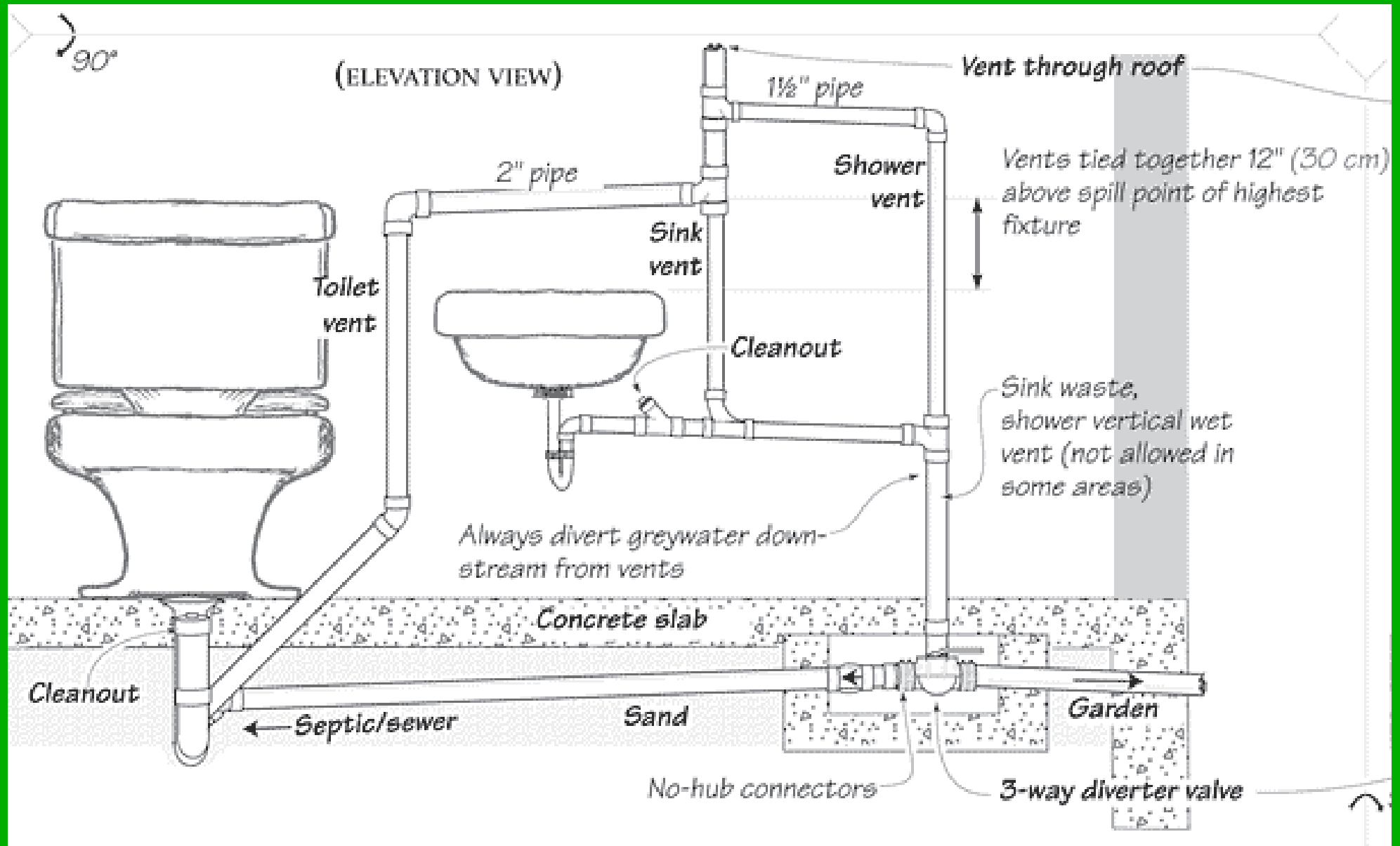
"Create an Oasis with Greywater", Art Ludwig

H2Oduino?

Reroute rainwater to tanks based on how full

Smell wastewater to determine if grey or black

Water beds only until soil is saturated

Nutrients: Compost

pallet composter

Nutrients: Compost

Instructables worm bin bag

Nutrients: Human Waste
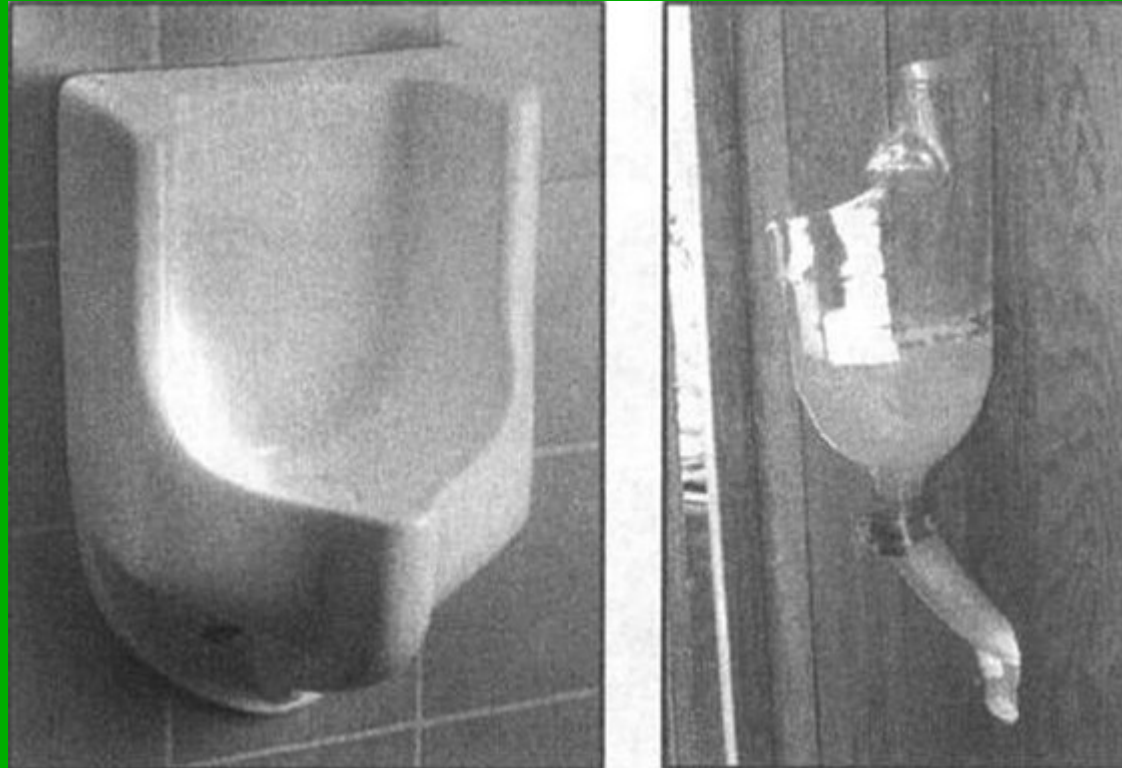
Urine diluted 3:1 with water = fertilizer

Liquid Gold: The Lore and Logic of Using Urine to Grow Plants

Nutrients: Human Waste

"All fecal microorganisms... will die if the temperature exceeds 46C (114.80F) for one week."

Humanure Handbook

Pooduino?

Measure input of C and N to help balance

Monitor temp and time of composting

Pass air over solar mass for more heat

Space: Empty Lots
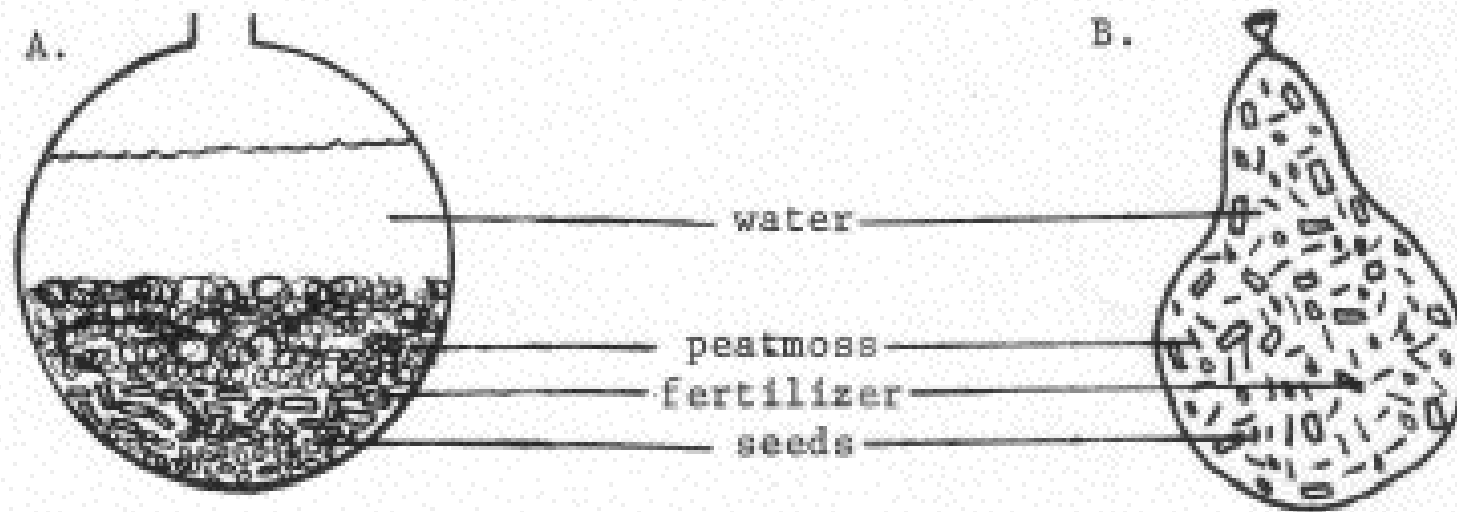

Edible estates

Space: Empty Lots

Add seed and fertilizer to grenade membrane:

Add seeds and fertilizer first, followed by moist peatmoss "crumbs". Stuff the opening at the top with a small piece of tissue. Gently shake to mix thoroughly.

Add seeds and fertilizer first, followed by moistened peatmoss "crumbs". Stretch the mouth of the balloon over the faucet mouth and carefully fill with water. Tie off the opening. Gently shake to mix thoroughly.
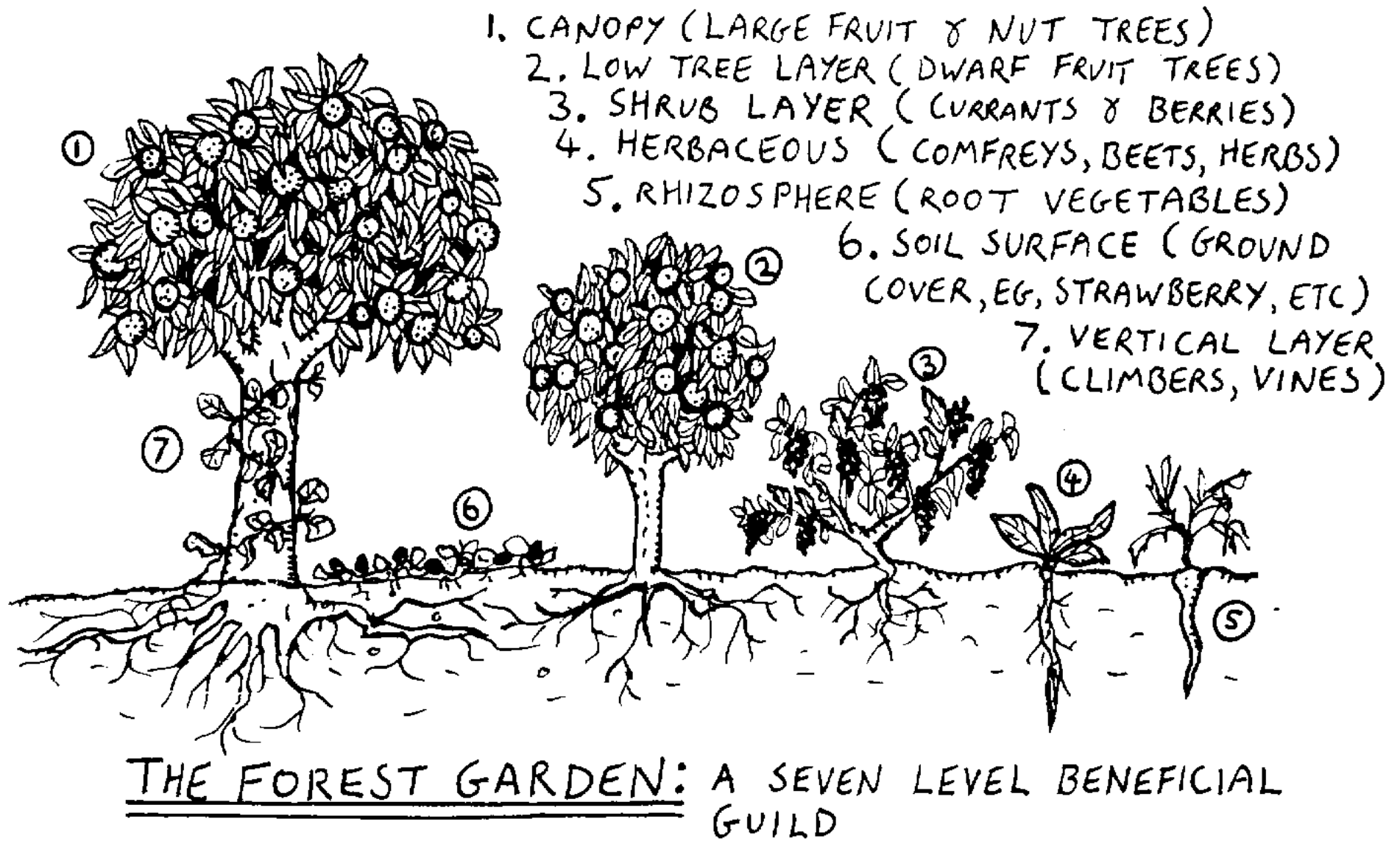
A.

B.

water

peatmoss
fertilizer
seeds

Wikipedia seed bombing

Space: Food Forests

Instructables upside down tomato

Space: Food Forests

1. CANOPY (LARGE FRUIT & NUT TREES)
2. LOW TREE LAYER (DWARF FRUIT TREES)
3. SHRUB LAYER (CURRANTS & BERRIES)
4. HERBACEOUS (COMFREYS, BEETS, HERBS)
5. RHIZOSPHERE (ROOT VEGETABLES)
6. SOIL SURFACE (GROUND COVER, EG, STRAWBERRY, ETC)
7. VERTICAL LAYER (CLIMBERS, VINES)

THE FOREST GARDEN: A SEVEN LEVEL BENEFICIAL GUILD

Wikipedia forest gardening

Birduino?

Drop seeds on whatever looks like lawns

Record (and report) irresponsible watering

Strike fear in hearts of garden trashers

Time: Ignore Seasons

Instructables: Build an Easy 5 x 5 Home Greenhouse for under $25

Time: Ignore Seasons

Growing power

Time: Grow Faster

Instructables hydroponic food

Time: Grow Faster

Wikipedia aeroponics

Fooduino?

Maintain minimum greenhouse temperature

Add nutrients as needed to maintain proper ph

Start new plants based on harvesting of existing

Summary: Let's Get to Work!

Questions?

Via Chris Glass

garduino.dirtnail.com
luke@lukeiseman.com