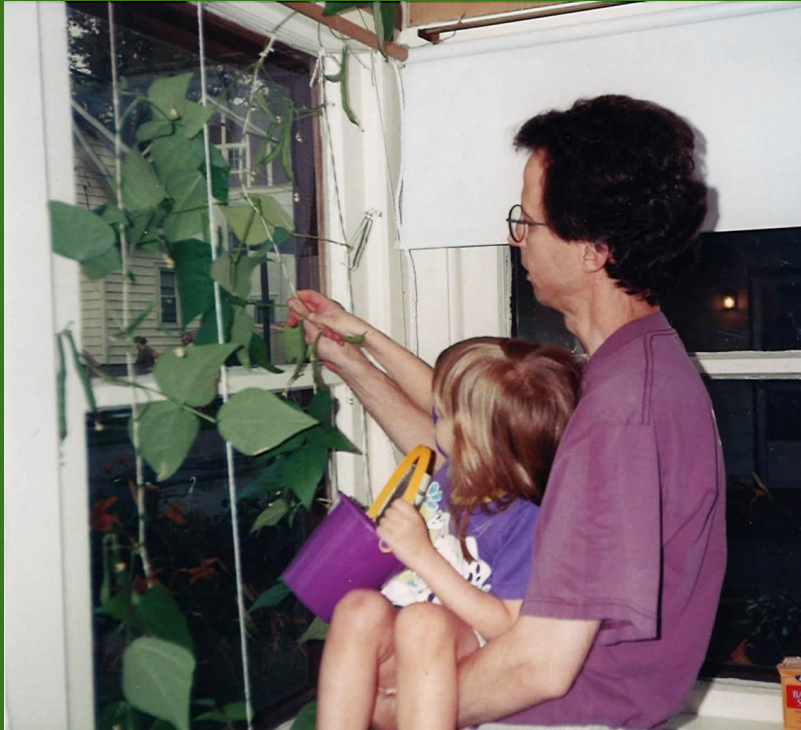


Seed Starting



Steve Koontz

steve@KeepItWatered.com

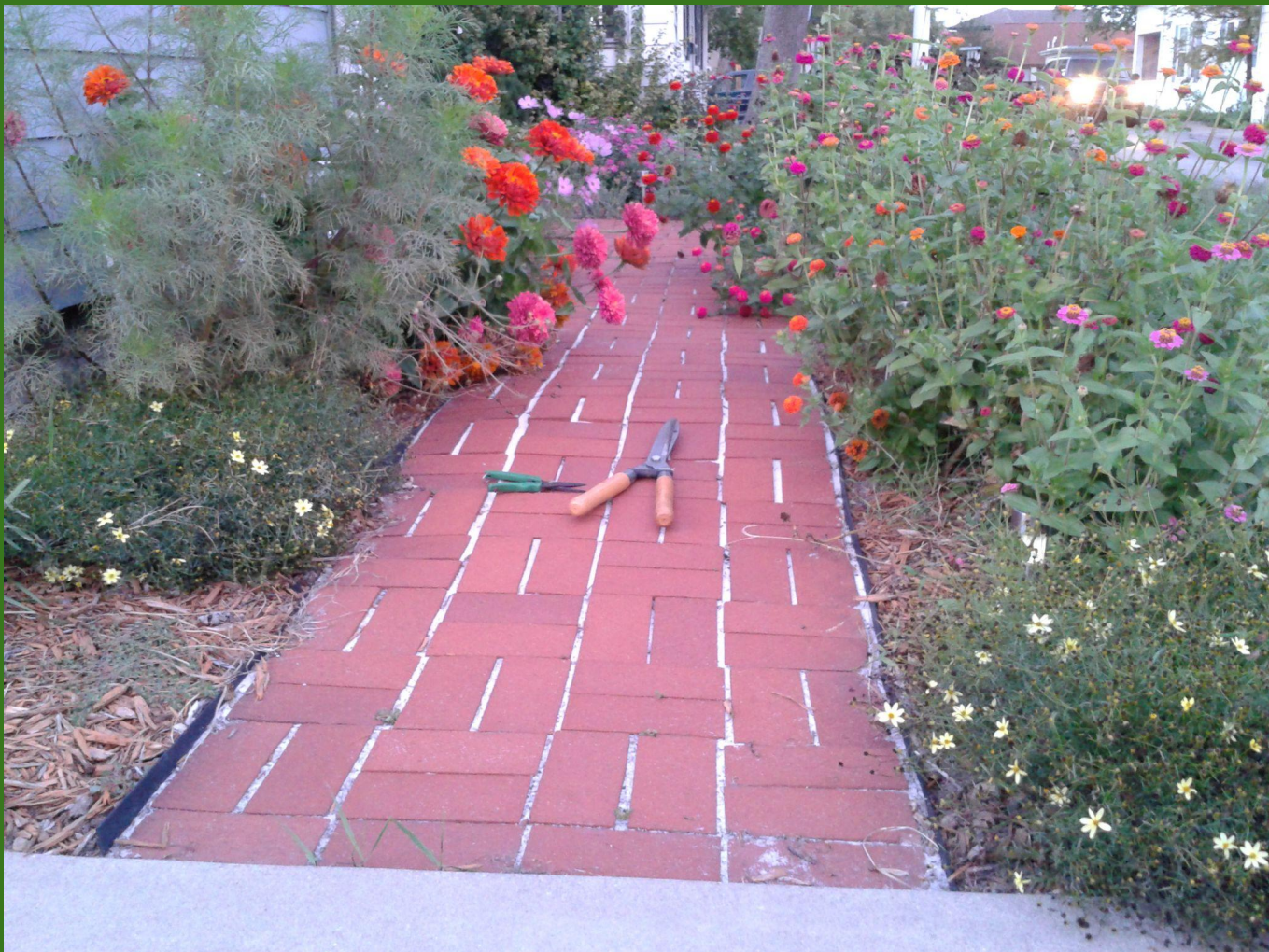
 keep it watered















Hydroponic Systems

Small



LetPot

Grow 5-21 plants on a
countertop

Medium



Tower Garden

Grow 20-28 plants in your
classroom

Large



Harvest Wall

Grow 36-720 plants for
your cafeteria

X-Large



Anu

Grow 60 to 3,920 plants in
a controlled space



keep it watered



<https://keepitwatered.com/growing-plants-from-seed/>

Purdue Extension

<https://www.extension.purdue.edu/extmedia/HO/HO-14-W.pdf>

What's in a Seed?

What's in a Seed?

Seed embryo

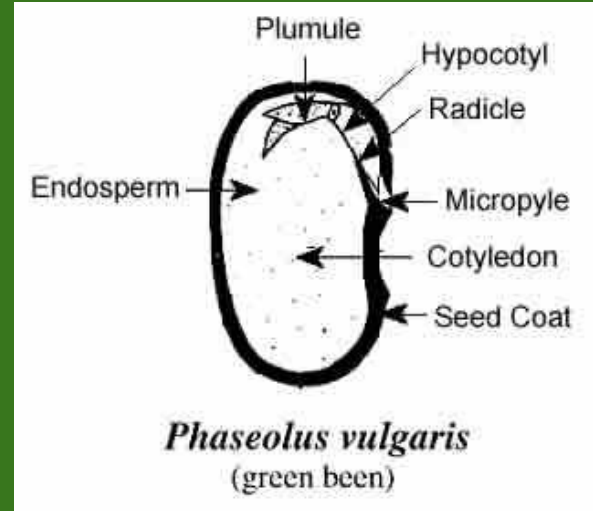
Tiny root (radicle)

Stem (plumule)

Leaf-like part (cotyledons)

Stored food (endosperm)

Seed Coat



What Seeds Need to Sprout

What Seeds Need to Sprout

Some need fire - Giant Sequoia

Some need darkness - Onions, chives

Some need light - Coleus

All need moisture

<https://www.thompson-morgan.com/effect-of-light>

Where to Get Seeds?

Where to Get Seeds?

Walmart, Menards, etc.

Online

Parkseed.com

Trueleafmarket.com

Driftlessseeds.com

Seed Requirements

Indiana law - minimum germination standards.
If below standard, package must show percentage.
Different for each seed.

Examples

Spinach = 60%

Cabbage = 75%

Celery = 55%

<https://iar.iga.in.gov/code/2026/360/1#360-1-1-7>

Seed Types

Hybridization (Hybrid Seeds)

Heirlooms

Open Pollinated

Organic

Treated

GMO (Genetically Modified)

Seed Types

Hybridization (Hybrid Seeds)

Pollen of 2 species is crossed to get desired trait

Occur naturally

Commercially (often labeled F1)

1st Generation cross - good plant

Seeds from that 1st Generation plant are unstable

Patio Choice Red Tomato Hybrid

Seed Types

Cocker Spaniel with a Poodle



Seed Types

Cockapoo



Seed Types

True lemon + mandarin orange tree



Seed Types

Meyer Lemon Tree



Seed Types

Heirlooms

Seeds saved for 50+ years

Passed down within a family or community (Like heirloom jewelry)

<https://seedsavers.org>

Seed Types

Purebred

Boston Terrier



Seed Types

Heirlooms

Buttercrunch Lettuce



Seed Types

Open Pollinated

Pollination by insect, wind, human, etc.

Greater amount of variation between plants

Slowly adapt to local growing conditions

Can be saved and grown each year

'Dark Green' Zucchini

Seed Types

All Heirloom are Open Pollinated

All Open Pollinated are not Heirloom

Seed Types

Organic Seeds

Produced without the use of synthetic pesticides, fertilizers, or genetically modified organisms

Organic could be Heirloom, Open Pollinated, or Hybrid

Seed Types

Treated seeds

Coated with fungicides, insecticides, or other chemicals to protect them from pests and diseases.

Seed Types

GMO Seeds

Genetically modified

DNA is spliced into the plant to get a desired trait like pest resistance.

Where can you buy GMO seeds?

Seed Types

You can't

GMO seeds are bred for farmers raising corn,
soybeans, etc

Questions



Seed Saving



Seed Saving

2 Methods

- 1) Know the proper technique for selecting, producing, handling, and storing seeds.

Seed Saving

2 Methods

- 1) Know the proper technique for selecting, producing, handling, and storing seeds
- 2) Toss the seeds into an envelope and hope for the best

Seed Saving

Flower seeds

Marigolds, zinnias, and others winter well

Vegetable seeds

No hybrid seeds

Seed Saving

Allow plant to bolt

Let flowers grow and die back

Cut the flowers once dry using a paper plate to catch the seeds

<https://rootsandrefuge.com/a-complete-guide-to-seed-saving/>

Seed Storage

Dry, cool, and dark

Seeds in envelope/Purchased Seed packets

Tightly closed jars

Store in the fridge, not the freezer

Seed Storage



Seed Storage



Questions?



Containers

Plastic trays

Clay/plastic pots

Peat pots

Egg cartons

Plastic pack, flats, and plugs

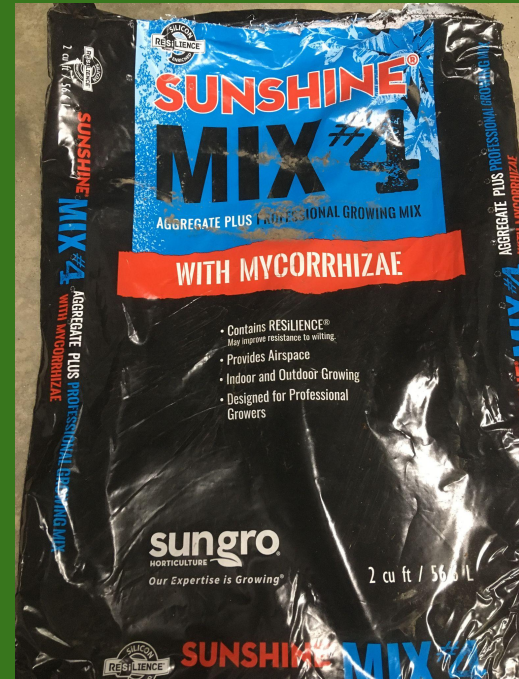
Medium

Soil

No garden soil

Good quality potting soil

Sunshine Mix #4





Compressed Peat Pellets

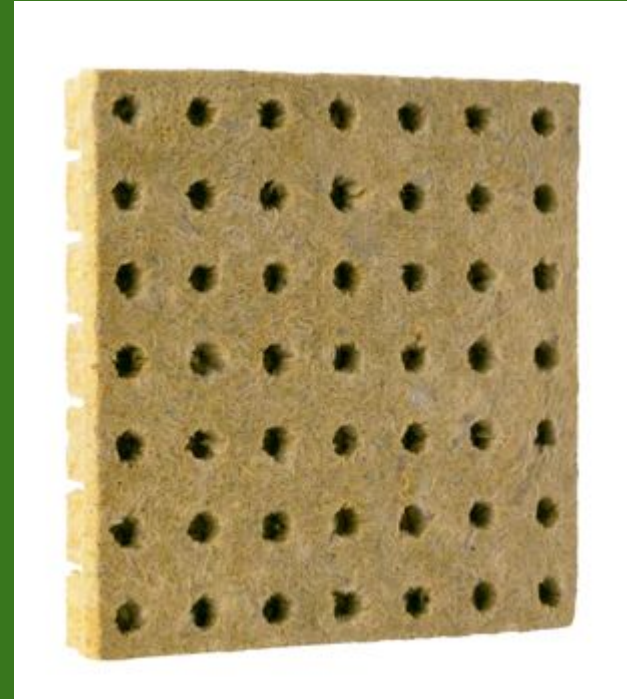


Synthetic mixes

Coco coir, vermiculite, perlite

<https://theseedsage.com/blog/diy-organic-seedling-mix-for-cheap>

Plugs and Rockwool



Artificial Light

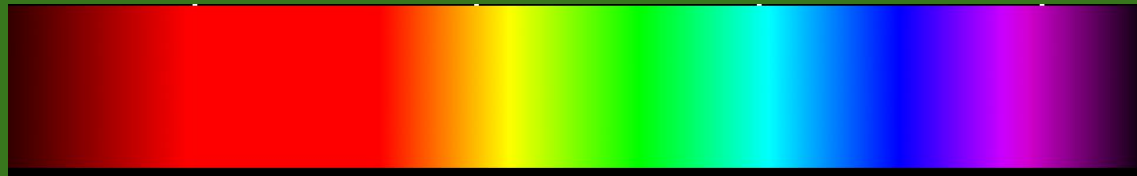


2000-3000K

3100-4500K

4600-6500K

Color Temperature (KELVIN)	2000K - 3000K	3100K - 4500K	4600K - 6500K
Light Appearance	Warm White	Cool White	Daylight



Artificial Light


5,000 K – 6,500 K



Artificial Light

Lighting Facts Per Bulb	
Brightness	870 lumens
Estimated Yearly Energy Cost \$1.57 Based on 3 hrs/day, 11¢/kWh Cost depends on rates and use	
Life	5.5 years
Light Appearance Warm Cool 2700 K	
Energy Used	13 watts
Contains Mercury For more on clean up and safe disposal, visit epa.gov/cfl .	


Artificial Light

6500K Shop Light





Kihung 8 Pack LED Shop Light Fixture 2FT 6500K 10W 1100LM, T5 Super Bright White LED Tube Strip for Garage, Workshop, Ceiling, Under Cabinet Light, Frosted Cover, Linkable, with ON/Off Switch

[Visit the Kihung Store](#)
4.6  | 1,949 | [Search this page](#)
200+ bought in past month


\$49⁹⁹ (\$6.25 / Count)

FREE Returns 

Coupon: [Apply \\$5 coupon](#) [Terms](#)

30-day refund/replacement 

Color: **6500K**







Lettuce vs Tomato

Artificial Light

Light Appearance

Kelvins

Blue = 6500 K – Foliage plants

Red = 2700 K – Fruiting plants



Echeveria



Dumb Cane



Questions



Variety of Plants to Grow



Determinate vs Indeterminate

Patio Choice Yellow Hybrid Cherry Tomato

Parthenocarpic Cucumbers

Kitchen Minis™ Quick
Snack Hybrid Cucumber
Seeds



Junior Sunflowers

www.sunflowerselections.com




Cacti

Cactus Seed Mix

1,000 Seeds

Planting Directions

Temperature: 70 - 70F
Average Germ Time: 14 - 28 days
Light Required: Yes
Depth: Surface sow seed and press in to soil
Sowing Rate: 5 - 10 seeds per plant
Moisture: Keep moist until germination
Plant Spacing: 6 - 9 inches

Warranty Information  at [outsidepride.com](https://www.outsidepride.com)

Outsidepride.com

PERENNIAL



LOC 158 F855

Cacti



Water

Unsoftened (Reverse Osmosis)

City Water - Works well

Well Water - RV Water Filter

Planting Seeds

May 10 - Last Frost Date

Hardening Off

Hardening Off

2 weeks before planting

Put outside in shade for a few hours a day

Gradually increase time and sun exposure

Don't let seedlings dry out

Common Veggies

Planting Seeds

Broccoli

Start 5-7 weeks before May 10

Plant in the garden 2 weeks before May 10

Broccoli prefers cool weather (Less than 80 degrees)

Planting Seeds

Cucumber

3-4 weeks before May 10

Start hardening off May 10

Plant in your garden May 24

Planting Seeds

Marigolds

Reseed very easily

Start 4-6 weeks before May 10

Begin hardening off May 10

Plant in garden May 24

Planting Seeds

Parsley

Wash seeds in mild detergent

Rinse and soak in water for 24 hours

Plant seeds 10-12 weeks before May 10

Seeds germinate slowly - 15-20 days

Begin to harden off April

Plant in garden around April 24

Planting Seeds

Peppers - Sweet/Big Jim Chili

Plant seeds 6-8 weeks before May 10

Begin to harden off April 26

Plant in garden May 10

Planting Seeds

Tomato - Cherry

Plant seeds 6-8 weeks before May 10

Begin to harden off April 26

Plant in garden May 10

Planting Seeds

Tomato - Rio Grande

Plant seeds 4-5 weeks before May 10

Begin to harden off April 26

Plant in garden May 10

Questions

Microgreens

Microgreens are young vegetable greens that are approximately 1–3 inches tall.

Microgreens



www.trueleafmarket.com





www.trueleafmarket.com/products/micro-mats-hydroponic-grow-pads











**GROW
A TREE!**

**PLANT A
LIVING
LEGACY**

**GIANT
SEQUOIA**

Sequoiadendron giganteum

**GENUINE TREE SEED
GERMINATION KIT**

AWESOME!

ABOUT

KIT GIVES YOU HELP FROM SEED GROWING GREENHOUSES AND WITH GROWING INSTRUCTIONS

THIS SEED KIT IS 100% GUARANTEED

THE JONSTON COMPANY

Giant Sequoia Tree



Ashley Miller
Food photographer









Steve Koontz

steve@keepitwatered.com

