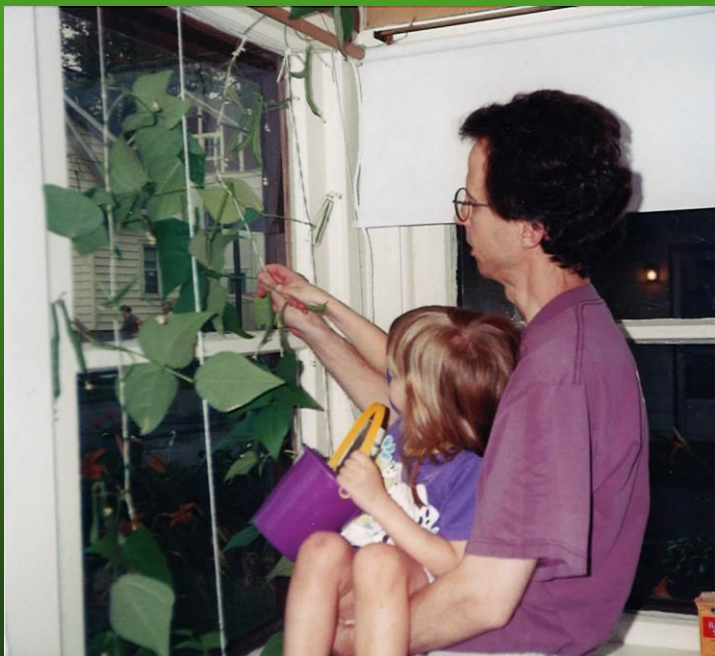


# Grow Healthy Food in Your Classroom and Home



Steve Koontz

[steve@KeepItWatered.com](mailto:steve@KeepItWatered.com)

  
keep it watered







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



<https://keepitwatered.com/ishn>

# Questions



# Objectives

1. List which edible plants are easiest to grow in a classroom.
2. Recall light requirements for growing edibles well indoors.
3. Defend decision to purchase and maintain an indoor classroom garden.

# Growing Indoors

## Easy to not-so-easy

1. List which edible plants are easiest to grow in a classroom.

# Edibles 101

All varieties of lettuce (Black Seeded Simpson)

Bok Choy

Arugula

Basil

# Edibles 201

Tomato  
Pepper

# Edibles 301

Cucumber  
Watermelon  
Strawberries

# Edibles 401

Corn

Apples

Potatoes

Why is lettuce easier to grow than a tomato?



# Why is lettuce easier to grow than a tomato?

## Pollinators



# Why is lettuce easier to grow than a tomato?

## Light Requirements



Why are tomatoes easier to grow than cucumbers?



# Why are tomatoes easier to grow than cucumbers?

Tomato: Self-pollinate

Cucumber: Cross-pollinate



# Self-pollinating

Same flower contains male and female parts



# Pollination



Self-pollinating

Shake the plant  
daily when flowers  
emerge

# Cross-pollinating

- Different flower that's male and female
- Pollen needs to go between the flowers

# Cross-pollinating

Examples:

Cucumbers - most varieties

Corn

Zucchini

# Cross-pollinating

Non-pollinating - Parthenocarpic

Examples:

Cucumbers - some varieties

# Where to Get Seeds?

**Walmart, Menards, etc.**

## **Online**

[Parkseed.com](http://Parkseed.com)

[Trueleafmarket.com](http://Trueleafmarket.com)

[Driftlessseeds.com](http://Driftlessseeds.com)

# Questions?



# Started tomato plants indoors, but spindly?

2. Recall light requirements for growing edibles well indoors.

# Light - Outside

## The Sun

Contains the full spectrum of light (rainbow)



# Light - Outside

ROYGBIV

Red, Orange, Yellow, Green, Blue, Indigo, Violet



# Light - Outside

ROYGBIV

**Red**, Orange, Yellow, Green, **Blue**, Indigo, Violet



# Light - Outside

**Blue:** Grow good leaves

**Red:** Grow good fruit



# Light - Outside

**Blue:** Grow good leaves

**Red:** Set fruit



# Light - Outside

## Tomato Plant

**Blue:** Grow good leaves

**Red:** Set fruit



# Light - Outside

**Blue:** Grow good leaves

**Red:** Set fruit



Started tomato plants indoors, but spindly?

**Blue:** Grow good leaves

Started tomato plant but weak fruit?

**Red:** Grow good fruit

The sun gives us both



# Lighting Indoors

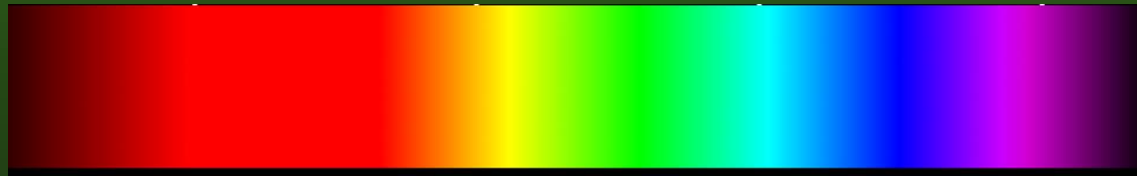


2000-3000K

3100-4500K

4600-6500K

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





2000-3000K

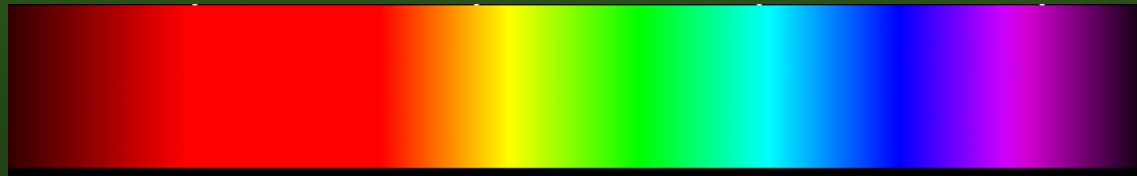
3100-4500K

4600-6500K

Fruit

Leaves

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



# Artificial Light

## Light Appearance

Blue = Daylight: Foliage plants (5000-6500K)

Red = Warm White: Fruiting plants (2000-3000K)

# Artificial Light



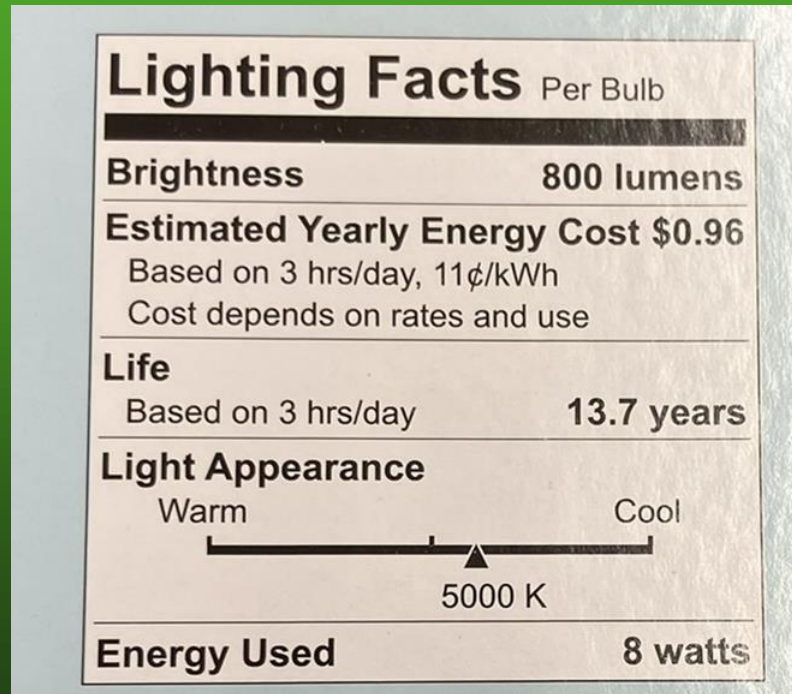
# Artificial Light



# Artificial Light



# Artificial Light



# Artificial Light



# Artificial Light

## Daylight (6500K) Shop Light



**8 pack**

**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 ★★★★★ (2,710) | Search or ask

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**-15%** \$42<sup>49</sup> (\$5.31 / count)  
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Size: **2 FT-8 Pack**

**Prime Member Price**

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[Join Prime](#) to get **FREE** delivery **Sunday, November 2**. Order within 6 hrs 43 mins

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Returns: **FREE 30-day refund/replacement**  
Payment: Secure transaction  
[See more](#)

**Regular Price**

\$49<sup>99</sup> (\$6.25 / count)

**FREE** delivery Wednesday, November 5

Ships from: Amazon  
Sold by: Kihung Tech



# Artificial Light

Lights on 12-14 hours a day

# Grow a Tomato

Start plant with...

Daylight

(5000-6500k) bulb

# Grow a Tomato

Tomato starts to flower

Switch to Soft White

(2000-2700k) bulb

# Artificial Light

Both Red and Blue Spectrum



# Questions?




# Water

Unsoftened (Reverse Osmosis)

City Water - Works well

Well Water - RV Water Filter

# RV Filter



**RV inline water filter with Flexible Hose Protector, Dedicated for RVs and Marines, 2 pack Drinking, Washing filter, Reduces Lead, Fluoride, Chlorine, Bad Taste, Odor**

Visit the BELVITA Store

4.6 ★★★★★ (3,022) | Search or ask

200+ bought in past month



**\$25<sup>99</sup>** (\$13.00 / count)

FREE Returns

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Color: **blue 2**

 \$25.99 (\$13.00 / count)	 \$18.99 (\$9.50 / count)
---	--

**Material** Activated Carbon

**Product Dimensions** 2.52"D x 2.52"W x 10.91"H

8 VIDEOS

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Deliver to Steve - Winona Lake 46590

**In Stock**

[www.amazon.com/dp/B08BHPBNL2](http://www.amazon.com/dp/B08BHPBNL2)

# Growing Medium

Soil



Water



# Growing Medium



# Soil-less: Rockwool



# Soil-less: Pods or Sponges



# Soil-less: Nutrient



# Variety of Plant

# Indeterminate vs Determinate

## Fruiting Plants

Indeterminate - needs support



Beefsteak  
Cherry tomato

# Determinate - Bushy



## Micro Tom Tomato

<https://seedsnsuch.com/products/micro-tom-tomato-seeds>

# Determinate - Bushy



Kitchen Mini Quick Snack Cucumber

<https://www.parkseed.com/products/kitchen-minis-quick-snack-hybrid-cucumber-seeds>

# Questions?



# Soil-less Growing Systems

Hydroponic

Aeroponic

Aquaponic

# Soil-less Growing Systems

Hydroponic - Roots in water

Aeroponic - Roots in the air

Aquaponic - Fish in the water



Hydroponic



# Rockwool 1.5”

<https://us.towergarden.com/collections/nutrients-supplies/products/rock-wool-98#keepitwatered>

# Soil-less Growing Systems



Hydroponic

[KeepItWatered.com/letpot](https://KeepItWatered.com/letpot)

# Soil-less Growing Systems



Aquaponic



Aeroponic

Tower Garden

[www.keepitwatered.com](http://www.keepitwatered.com)



# Anu GrowPod

[www.growanu.com](http://www.growanu.com)

# Plants to Grow in System

Lettuces - Arugula, Bibb, Bok Choy, etc.

Herbs - Basil, Oregano, etc.

Determinate fruiting plants

# Plants to Grow in System

Sunflowers  
Marigolds  
Pansies  
...and others



# Plants not to Grow in System

- Root Crops
- Trees
- Corn

# Questions?



# Finding the Money

## Start Local

Principal/PTO/Parents

Businesses parents work/own

Kiwanis/Optimist Clubs

Banks

Gas Stations like Casey's

# Find the Money

## Statewide Organizations

Purdue Extension Office

Farm Bureau in your county (<https://www.infarmbureau.org>)

Foundations

County Health Department

[keepitwatered.com/grants](http://keepitwatered.com/grants)

# Hiring a Grant Writer

Sheena Weller of Weller Grant Services

[www.wellergrantservices.com](http://www.wellergrantservices.com)

# Parent Involvement



# Why an Indoor Garden

3. Defend decision to purchase and maintain an indoor classroom garden.

Grow where kids see it

Teach STEM, Life Skills, Healthy Eating Habits, etc.

Curriculum/lesson plans available integrated into state standards

Growing systems are easy to use and come in all sizes and budgets

Steve will help! :)

# Outdoor Gardening

Graham Towerton - Permaculture

[graham@permaculturecanada.world](mailto:graham@permaculturecanada.world)  
[permacultureadventuresmi.com](http://permacultureadventuresmi.com)

# Grow Healthy Food



Steve Koontz

steve@KeepItWatered.com



<https://keepitwatered.com/ishn>

# Microgreens

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

# Microgreens



[www.trueleafmarket.com](http://www.trueleafmarket.com)





[www.trueleafmarket.com/products/micro-mats-hydroponic-grow-pads](http://www.trueleafmarket.com/products/micro-mats-hydroponic-grow-pads)











# Plant Microgreen Peas:

- Pour ½ of bottle onto soil
- Place microgreen mat on soil
- Turn water bottle to ‘spray’ and wet the mat
- Spread seeds over mat
- Spray seeds
- At home, place in dark place until they sprout
- Put under daylight bulb



Steve Koontz

[steve@keepitwatered.com](mailto:steve@keepitwatered.com)





**GROW  
A TREE!**

**PLANT  
A LIVING  
LEGACY**

**GIANT  
SEQUOIA**

*Sequoiadendron giganteum*

**GENUINE TREE SEED  
GERMINATION KIT**

**ABOUT THIS KIT**  
KIT GIVES YOU EVERYTHING YOU NEED FROM SEEDS TO GROWING INSTRUCTIONS AND MORE!

AWESOME!

THE JONSTON COMPANY


# Giant Sequoia Tree



Ashley Miller  
Food photographer





A close-up photograph of two young Giant Sequoia seedlings growing in a glass container. The seedlings have thin, reddish-brown stems and small, green, needle-like leaves. The background is a soft, out-of-focus grey. The image is framed by a green border.

# Giant Sequoia Tree



Ashley Miller  
Food photographer

# Giant Sequoia Tree

