

A photograph of a greenhouse filled with rows of young green plants. The plants are growing in green trays and black pots. The text "GREATER LOWELL TECHNICAL HIGH SCHOOL TOPs Gardening/Greenhouse" is overlaid in white, bold, sans-serif font across the center of the image. In the background, a person is visible holding a green tray, and there are windows on the right side of the greenhouse.

GREATER LOWELL  
TECHNICAL HIGH SCHOOL  
TOPs Gardening/Greenhouse

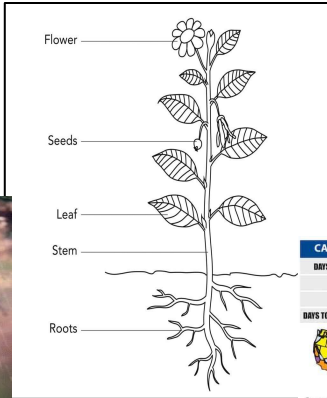
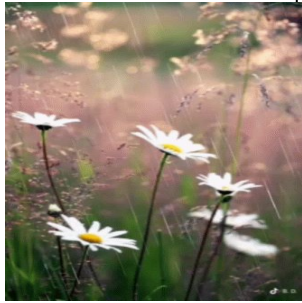
# **A little bit about Greater Lowell Technical High School and Transition Training....**

GLTHS is located in Tyngsboro, MA and has over 20 different technical shops. The Transitional Occupations Program provides education to intensive needs students. I'm a Transition Training Worksite Aide within our Special Education Department. Myself and the other Worksite Aides provide training to students who have finished their four years of high school and want to continue their learning. These Transition Training students can stay until they turn 22 years. They are taught job readiness in the school and use those skills at different worksites.

How did the greenhouse/gardens  
come to be???



# Learning about seeds and planting



CARE & MAINTENANCE		CUIDADO Y MANTENIMIENTO	
<b>DAYS TO GERM</b>	10 - 12	<b>DÍAS A GERMINAR</b>	10 - 12
<b>DEPTH</b>	1/4 in.	<b>PROFUNDIDAD</b>	6 mm
<b>SPACING</b>	3 in. / 18 in.	<b>ESPACIO</b>	92 cm / 45 cm
<b>DAYS TO HARVEST</b>	73 - 83	<b>DÍAS DE COSECHA</b>	73 - 83

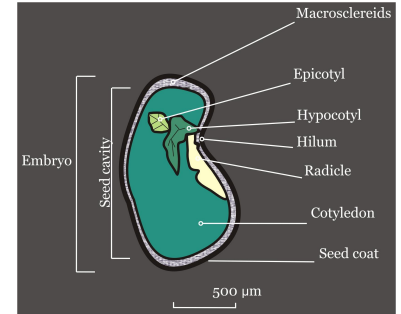
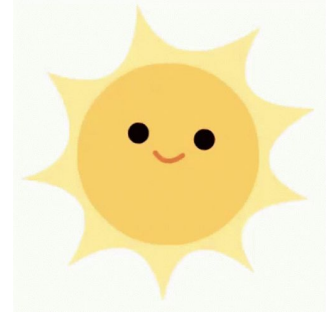
May - June / Mayo - Junio
April - May / Abril - Mayo
March - April / Marzo - Abril
February - March / Febrero - Marzo

Start seeds indoors, 6 to 8 weeks before the last frost. Ok in mild climates sown outdoors. Transplant to garden after frost. Harden off before transplanting. Thin when plants are a few inches tall.

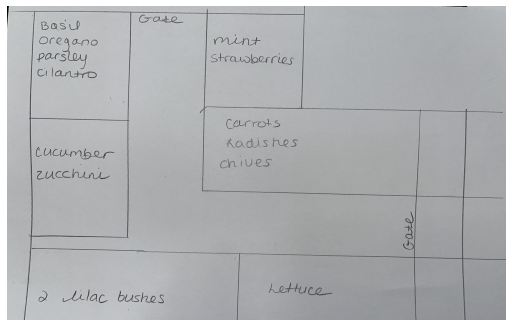
Comienza a sembrar en interiores, 6 a 8 semanas antes de la helada. Con climas benignos, siembra en exteriores. Transplante al jardín después de la helada. Aclimata antes de transplantar. Reduzca cuando las plantas crecen unas cuantas pulgadas de alto.



Plantation Products LLC,  
202 S. Washington St.  
Norton, MA 02716  
800mygreen.com



# Planning



"Why try to  
 explain  
 miracles to  
 your kids when  
 you can just  
 have them plant  
 a garden."  
 - Robert Brault

CARE & MAINTENANCE	CUIDADO Y MANTENIMIENTO
<b>DAYS TO GERM</b> 10 - 12	<b>DÍAS A GERMINAR</b> 10 - 12
<b>DEPTH</b> 1-4 in.	<b>PROFUNDIDAD</b> 6 mm
<b>SPACING</b> 3 ft / 10 ft	<b>ESPACIO</b> 92 cm / 46 cm
<b>DAYS TO HARVEST</b> 70 - 83	<b>DÍAS DE COSECHA</b> 70 - 83



May - June / Mayo - Junio  
 April - May / Abril - Mayo  
 March - April / Marzo - Abril  
 February - March / Febrero - Marzo

Start seeds indoors, 6 to 8 weeks before the last frost. Or, in mild climates sow outdoors. Transplant to garden after frost. Harden off before transplanting. Thin when plants are a few inches tall.

Comience a sembrar en interiores 6 a 8 semanas antes de la última helada. En climas benignos, siembre en exteriores. Transplante al jardín después de la helada. Acimatiz antes de transplantar. Reduzca cuando las plantas tienen unos cuantos pulgados de alto.



Plantation Products LLC.  
 202 S. Washington St.  
 Norton, MA 02766  
 berrynews.com



# Useful resources!

[www.massfarmtoschool.org](http://www.massfarmtoschool.org)

[www.millcitygrows.org](http://www.millcitygrows.org)

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

[www.wlfarm.org](http://www.wlfarm.org)

[www.grownativemass.org](http://www.grownativemass.org)

## A VEGETABLE GROWING CHEAT SHEET

### VEGETABLES FOR A PLOT GARDEN

### VEGETABLES FOR A PATIO GARDEN

*\*Use Propagator Kit or Rootliner to grow more seedlings before planting outdoors.*

### PLANTING, CARE & HARVESTING

- USE PROPAGATOR KIT OR ROOTLINER TO GROW SEEDLINGS BEFORE PLANTING
- SOW IN DIRECT SUNLIGHT
- WATER TO KEEP SOIL MOIST THROUGHOUT AFTER SOWING IN PLACE OF POT
- HILL UP SOIL TO GERMANTS (BRUSSEL SPROUTS)

- CHOP TO LEAVE BETWEEN SEEDS (IN CASE)
- SOW INDOORS OR UNDER GLASS
- WATER REGULARLY BUT AVOID OVERWATERING
- HILL UP SOIL TO REACH HARDY (BRUSSEL SPROUTS)

**Work out for these pests:**

- BEETLES
- CATERpillARS
- FLEAS
- FLIES
- MICE
- MOLLUSCS
- SLUGS
- SNAILS

**Work out for these pests:**

- BEETLES
- CATERpillARS
- FLEAS
- FLIES
- MICE
- MOLLUSCS
- SLUGS
- SNAILS

MONTH	PROPAGATOR KIT OR ROOTLINER USE DATE	SOWING DATE	SOWING DATE TO HARVEST	HARVEST DATE	MONTH																	
					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC						
BEETROOT																						
BORLOTI BEANS																						
BROAD BEANS																						
BROCCOLI																						
BRUSSEL SPROUTS																						
CABBAGES																						
CARROTS																						
COUROUTTES																						
CUCUMBERS																						
FRENCH BEANS																						
KALE																						
LEEK																						
LETTUCES																						

### COMPANION PLANTING

Plant these vegetables together to make the most use of space and deter pests.

### DID YOU KNOW?

TOMATOES REPEL THE CATERpillARS THAT CHOP UP CABBAGE LEAVES

CHIONON AND LEEKS REPEL CARROT FLEAS

CHIONON AND LEEKS REPEL CARROT FLEAS

CHIONON AND LEEKS REPEL CARROT FLEAS

RADISHES DETER POTATO BEETLES

CHIONON AND LEEKS REPEL CARROT FLEAS

CHIONON AND LEEKS REPEL CARROT FLEAS

RADISHES DETER POTATO BEETLES

CHIONON AND LEEKS REPEL CARROT FLEAS

CHIONON AND LEEKS REPEL CARROT FLEAS

RADISHES DETER POTATO BEETLES

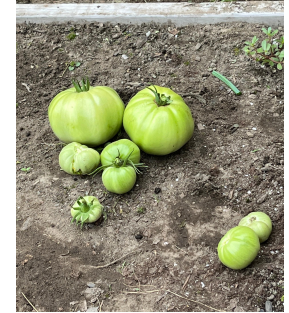
CHIONON AND LEEKS REPEL CARROT FLEAS

### SOURCES

AN IN-DEPTH COMPANION PLANTING GUIDE - NOTHEREATHWELLS.COM  
 COMPANION PLANTING - ORGANICALLIARDING.COM  
 GROW GUIDE FOR PARSNIPS - BEETROOT.CO.UK  
 BEETROOT GUIDE FOR PARSNIPS - BEETROOT.CO.UK  
 VEGETABLE SOWING CALENDAR - BEETROOT.CO.UK  
 WHAT CAN I EAT? - THEGARDENMAGAZINE.COM

good to be **hunting**  
www.grownative.com

# In September we harvest remaining produce and prepare gardens for the winter



# Researching vegetables and fruits...

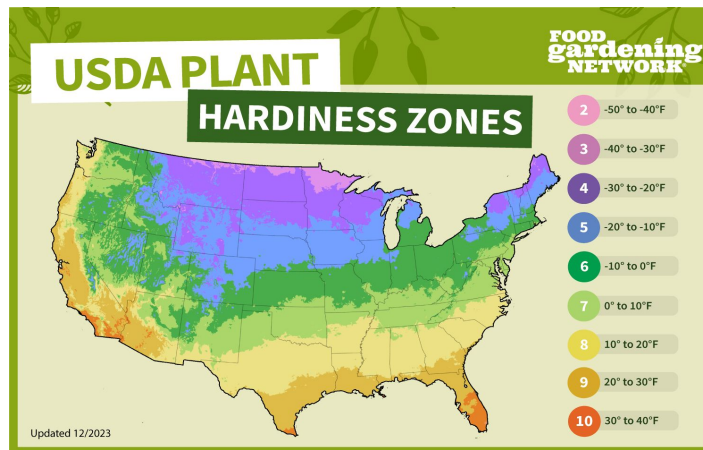
Sow indoors

Planting time

Germination period

Plant in sun or shade

Pollinators



How dependent are foods on pollinator insects?

Our World in Data

<p><b>No dependency</b> Yields are not affected by pollinators</p> <ul style="list-style-type: none"> <li> Cereals: wheat, maize, rice, sorghum, barley, rye, millet, oats</li> <li> Roots and tubers: cassava, potatoes, sweet potatoes, carrots</li> <li> Legumes including lentils, peas, chickpeas</li> <li> Fruit and veg including bananas, pineapples, grapes, lettuce, pepper</li> <li> Sugar crops: sugar cane and sugar beet</li> </ul> <p><small>Also includes: areca nuts, asparagus, cabbages, castor oil seed, cauliflower, chicory roots, dates, garlic, hazelnuts, jojoba seeds, leeks, olives, onions, pistachios, quinoa, spinach, taro, triticale, walnuts, yams.</small></p>
<p><b>Little dependency</b> Yield reduction of 0% to 10% without pollinators</p> <ul style="list-style-type: none"> <li> Fruit and veg including oranges, tomatoes, lemons, limes, papayas</li> <li> Oilcrops including palm, poppy seed, linseed, safflower seed</li> <li> Legumes including beans, cow peas, pigeon peas</li> <li> Groundnuts</li> </ul> <p><small>Also includes: bambara beans, chillies, grapefruit, persimmons, string beans</small></p>
<p><b>Modest dependency</b> Yield reduction of 10% to 40% without pollinators</p> <ul style="list-style-type: none"> <li> Oilcrops including sunflower seed, rapeseed, sesame, mustard seed</li> <li> Soybeans</li> <li> Fruits including strawberries, currants, figs, gooseberries, eggplant</li> <li> Coconuts and okra</li> <li> Coffee beans</li> </ul> <p><small>Also includes: broad beans, karite nuts, seed cotton</small></p>
<p><b>High dependency</b> Yield reduction of 40% to 90% without pollinators</p> <ul style="list-style-type: none"> <li> Fruits including apples, apricots, blueberries, cherries, mangoes, peaches, plums, pears, raspberries</li> <li> Nuts including almonds, cashew nuts, kola nuts</li> <li> Avocados</li> </ul> <p><small>Also includes: cucumber, buckwheat, nutmeg, anise, fennel, coriander</small></p>
<p><b>Essential</b> Yield reduction greater than 90% without pollinators</p> <ul style="list-style-type: none"> <li> Fruits including kiwi, melons, pumpkins, watermelons</li> <li> Cocoa beans</li> <li> Brazil nuts</li> </ul> <p><small>Also includes: vanilla, quinces</small></p>

Sources: Marcelo Alzen et al. (2019) and Alexandra-Maria Klein et al. (2006). Icons sourced from Noun Project. OurWorldInData.org - Research and data to make progress against the world's largest problems. Licensed under CC-BY by the author Hannah Ritchie.



# Budget & Pricing



**THE HOME DEPOT** How does get more done.

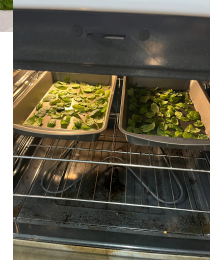
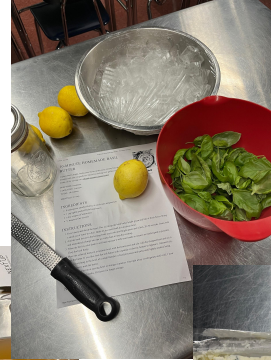
288 DANIEL WEBSTER HWY.  
 NASHUA, N.H. 03060 (603) 891-4300

3481 00001 44345 03/15/24 10:20 AM  
 SALE CASHIER ERIN

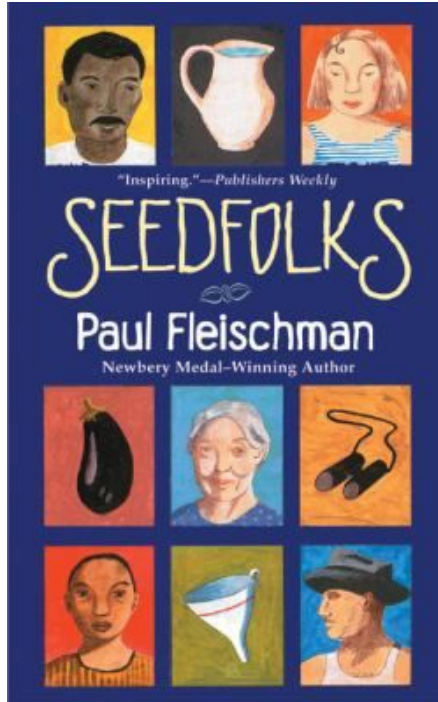
03064111209 ECHBUTFLYMIX <A>	10.98N
ECHINACEA BUTTERFLY MIX	
030641354767 STRAWBERRY <A>	4.98N
STRAWBERRY OZARK BEAUTY	
727193800759 MINIROLTRY <A>	
6 IN PLASTIC MINI ROLLER TRAY - BEIG	8.40N
581.68	
032247278140 250T MG PM <A>	
25 OT MG POTTING MIX	19.94N
289.97	
033349412517 JIFFY P550 <A>	
JIFFY PEAT STRIPS 50 POTS	22.35N
584.47	
068060465559 24060P3P <A>	5.98N
3M PGP BLOCK 60G 1PK	
022367568313 GL EXT FLT <A>	35.98N
GLIDDEN PREM EXT FLAT BASE 3 1120Z	
033349660185 JIFFY 120SSW <A>	
JIFFY 12 OT. ORG SEED STARTING MIX	15.94N
287.97	
810667031299 BITR SEED <A>	
PAW OJO WHITE STEM 500MG	8.94N
382.98	
011192642084 FM VEGE <A>	
PEPPER MONSTER BELL GIANT	12.45N
582.49	
041530437782 FLWR SEED <A>	
VMI FORGET-ME-NOT, BLUE BIRD	



# Learning how to use our produce



# Seedfolks



Together we read the book *Seedfolks*. This book allows students to understand different cultures. It also teaches them about working together for a common goal.

The students then worked on questions to ask our school community about the fruits and vegetable they eat.

# Questions to the school community....

- 1) What are some of the traditional vegetables and/or fruits you commonly use in your cultural or ethnic foods?
- 2) How do these vegetables and/or fruits play a part in your cultural or family traditions/celebrations/rituals?
- 3) Are there any specific recipes that are commonly made with these vegetables and/or fruits?
- 4) Are these vegetables and/or fruits more difficult to find/buy locally compared to where you or your family originated from? If so, how have you overcome this challenge in purchasing them?
- 5) Do you have any personal memories or experiences related to these vegetables and/or fruits from your childhood or family gatherings?
- 6) How do you use these traditional vegetables and/or fruits in your everyday meals or special occasions?
- 7) Are there any symbolic or cultural meanings attached to certain vegetables and fruits from your culture?
- 8) Do you know if there is any health or nutritional value associated with these vegetables and/or fruits from your culture?
- 9) Do you know if there are any efforts in your community to preserve/promote/plant these traditional vegetables and/or fruits? If so, could you please tell us about these efforts?
- 10) Do you have any other information about these vegetables and/or fruits you would like to share?

# Most mentioned vegetables...



Bok Choy

Red Beans



Peppers

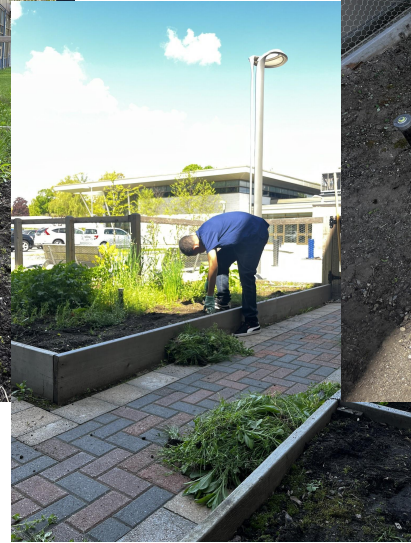


Eggplant

# Planting the seeds and caring for them



# Preparing the gardens and outdoor planting



# Change of plans...



When the students went to plant one of our gardens, they noticed this plant unknown to them. This was a perfect time to educate them on how plants not only nourish people, but also insects and animals. The milkweed was left alone.





# Plant Sale



# Plan to share harvest with school community

- 1) Harvest lettuce, kale, tomatoes, peppers and herbs for the school cafeteria before the summer
- 2) Culinary Arts staff & students will utilize the garden for produce and herbs.
- 2) Summer Enrichment Program
- 3) Summer School Students
- 4) Incoming Freshman Summer Program
- 5) After summer break both Cafeteria and Culinary Arts staff will use produce from the gardens



# Continuing efforts for next school year

- 1) Use of small aquaponics system in classroom
- 2) Grow lettuce year round in the greenhouse for Cafeteria and Culinary Arts
- 3) Grow herbs year round in the aquaponics system and greenhouse