THE GOOD FOOD MACHINE

a LoyaltyOne program

Healthy habits. Healthy lives.

A GUIDE FOR TEACHERS & EDUCATORS

All You Need To Know About The Good Food Machine in Schools or Community Centres

ABOUT LOYALTY ONE

LoyaltyOne, founder of the Good Food Machine, is a global leader in shopper analytics and loyalty program strategy, solutions and services. We believe in using our assets and expertise to create social innovation programs that drive social benefit and business value.

LoyaltyOne runs the Good Food Machine across Canada with support from expert food literacy charities and not-for-profits. Our goal is to help all children and youth learn and develop healthy habits for life. For more information about LoyaltyOne and how we make a difference, please visit **https://www.loyalty.com/home/about-us/corporate-responsibility**

OUR COMMUNITY PARTNERS:

FoodShare is a non-profit organization that works with communities and schools to deliver healthy food and food education. We believe everyone deserves access to affordable high-quality fresh food. Since 1985, FoodShare has created innovative programs like the Good Food Box, impacted what kids eat in school, and improved the way people eat and grow food across Toronto every day.

DEVELOPED WITH FUNDING SUPPORT FROM:

The Greenbelt Fund helps get more great Ontario food onto our plates. We support farmers and local food leaders to ensure that locally grown food is delivered through our public institutions, retail, and food service markets.

Possibility grows here.

LAND ACKNOWLEDGMENT

As we gather together, we acknowledge this sacred land on which we operate. It has been a site of human activity for 15,000 years. This land is the territory of the Huron-Wendat and Petun First Nations, the Seneca, and most recently, the Mississaugas of the Credit River. The territory was the subject of the Dish With One Spoon Wampum Belt Covenant, an agreement between the Iroquois Confederacy and Confederacy of the Ojibwe and allied nations to peaceably share and care for the resources around the Great Lakes. Today, the meeting place of Toronto is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work in the community, on this territory.

ACKNOWLEDGMENT

The Good Food Machine extends our sincere thanks to FoodShare Toronto, a best in class organization whose unrivaled expertise in teaching food literacy to children and youth makes this all possible.

Special thanks to the Field to Table Schools team at FoodShare for the creation of this fantastic Educator Package. We couldn't do this without you!

> ***"I NEVER KNEW THERE WERE THINGS CALLED HERBS BEFORE!"***
>
> *- Grade 5 Student*

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ABOUT THE GOOD FOOD MACHINE

Too many kids in Canada don't eat enough fruits and vegetables, and don't know enough about healthy food. Using seeds, tower gardens, mobile kitchens, bike blenders and lesson plans, the Good Food Machine (GFM) teaches young people how to grow, harvest, and cook healthy food in school and community programs. We educate and inspire young people to adopt healthier eating habits and skills that will stay with them for life.

The Good Food Machine operates in more than 200 schools and community centres across B.C., Manitoba, Ontario, Quebec, New Brunswick and Nunavut, including First Nation communities in northern Ontario. So far we are helping over 20,000 young people learn about healthy food and change their eating habits for the better.

How does it work?

LoyaltyOne donates Good Food Machine kits to schools including indoor growing towers, bike blender kits and curriculum-linked Growing and Learning Guides that help teachers run the Good Food Machine program from JK to Grade 12. We partner with food literacy and nutrition experts such as FoodShare Toronto, Roots to Harvest, Ontario Public Health, Student Nutrition Ontario and Global Teacher Prize Nominee Stephen Ritz. We also sell Good Food Machine kits to those that don't meet donation criteria.

How kids are learning skills and eating better

- Kids now know how to grow and prepare their own food
- Kids are eating better
- Kids now talk to their parents about healthy food
- Students are selling their produce at school markets, raising funds for their schools and learning valuable selling skills
- Students with autism and special needs enjoy engaging with their towers

Why do teachers love the Good Food Machine?

- 50% said it improved students' academics
- 23% said their classroom attendance increased
- 70% said it improved students' communication skills
- 78% said students took more initiative
- 92% said it improved students' sense of responsibility

Understanding the growing stages throughout the school or program year.

Before we jump into how the Tower Garden works, it is important to understand the growing stages that you will be experiencing with your students or participants.

During our first GFM pilot project, we were able to identify various stages that teachers and educators experienced throughout the school or program year. The combination of activities including workshops, lesson plans, site visits and more, helped us understand the variety of elements that are important for this program.

We have created this journey map that describes a teacher's experience throughout the GFM school year program. It showcases the different growing stages, considerations to take and the array of activities that were implemented in the classroom setting.

Visit the Journey Map in the Toolkit section and pin it next to your Tower Garden.

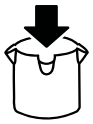
THE GOOD FOOD MACHINE
YEAR PROGRESSION

Phases

1
DISCOVER THE GOOD FOOD MACHINE

I don't know anything...
How do I approach it?

2
ASSEMBLE TOWER



I learned something...
How do I interpret?

3
DEVELOP & PLAN LESSON PLANS

I see an opportunity
What do I create?

4
GROW & HARVEST

I see things growing...
How do I cook it?

Steps

Week1: Get to know the Tower Garden & plant seeds

Week 1-4: Assemble tower & spray seeds continously

Week 5-6: Transplant seedlings to tower

Week 7-10: Seedlings develop to adult plants

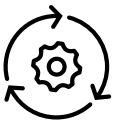
Week 10-14: First harvest of leaf

Week 11-16

5
ANIMATE TOWER

I have an idea
How do I build it?

6
REFLECT & EVALUATE



I tried something new...
How do I assess?

7
TELL YOUR GFM STORY

I gathered a lot...
How do I share it?

8
KEEP GROWING

I completed my first year...
How do I evolve it?

y greens and herbs

: Second harvest of leafy greens and herbs

Week 16-18: Remove old bitter plants/replace

Week 18+: Continue harvesting

Week 18+: Remove plants and final clean up

GUIDING PRINCIPLES WHEN WORKING WITH THE TOWER GARDEN

The Good Food Machine process relies on your ability to be intuitive, to interpret what you observe and to develop ideas that are emotionally significant to your students. We recognize that every teacher or community educator will have a unique and different experience with the Tower Gardens. It is therefore important that you integrate your interest, motivation and skills in the most respectful and integrative manner.

An operational or instructional guide can help your teaching setting to become a safe and inclusive space. Here are our six operational guides:

1. FOOD IS PERSONAL

Explore traditions, cultures and memories by creating a space for others to bring in their own relationship with food.

2. DEFER JUDGEMENT

Create a space that others can express their ideas freely. Make sure to facilitate conversations in the most inclusive and respectful manner. The key is to make everyone feel like they can contribute to ideas or experiences and allow others to build on it.

3. ENCOURAGE WILD IDEAS

Wild ideas can often give rise to creative leaps. Let your students or participants explore their creative side by being supportive and accommodating.

4. EMBRACE YOUR BEGINNER'S MIND

Approach things or problems as a novice even if you already know a lot about them. Let yourself learn from others and be willing to make learnings as inclusive and experimental as much as possible.

5. BE THE NEXT PICASSO

Use a variety of mediums to explain the work with the Tower Gardens, including visual tools. Encourage students or participants to draw, write, act or even sing.

6. STEP OUT OF YOUR COMFORT ZONE

Experiment as much as possible and engage with your students or community participants in a new experience. Get unstuck, break the routine and use the world around you to invigorate the work in your classroom. Do not feel afraid if things break or do not work - it's part of the learning process.

You can find a copy in the Toolkit section. We recommend posting this guide somewhere that students/participants can see throughout the Good Food Machine program.

“IT’S IMPORTANT TO LEARN HOW TO GROW OUR OWN FOOD, TO SAVE ON THE COST OF GROCERIES”

-GR.6 STUDENT
CHARLES WEBSTER TORONTO

1.
GET TO KNOW YOUR TOWER GARDEN

WHAT IS THE TOWER GARDEN?

The Tower Garden is a vertical hydroponic growing system. Hydroponics means growing plants in an air and mist environment without the use of soil or dirt as the growing medium. Water is used to deliver the nutrients to the plants. In the hydroponic system, the plants are placed in the Tower Garden sections and the roots of the plants hang below into the centre of the Tower Garden Base. The roots are sprayed at regular intervals with water and a nutrient rich solution.. A Tower Garden can grow 20 plants at a time and with the top extension kit, it can grow 28 in total.

1. Assembling The Tower Garden in Schools or Community Centres

Setting up the tower can be a fun and engaging activity to do with your students or community participants.

Before starting assembling the tower, here is important safety considerations:

1. The Tower Garden is a hydroponic growing system that is fragile. Make sure students/ participants handle the tower with care and do not stand on the Tower Garden.
2. Follow the safety instructions included with the Tower Garden pump. Do not attempt to plug or unplug the pump in rainy or damp conditions.
3. When draining your Tower Garden, keep the drain tube away from electrical outlets and extension cords. And do not overfill your Tower Garden, as this could cause water to run out of the electrical cord opening in the reservoir.
4. Do not place the Tower Garden where there is the potential for strong winds, such as high rise balconies.
5. Wear rubber gloves to protect your hands when mixing pH+Base, pH-Acid, Mineral Solution A, and Mineral Solution B. Although the mineral blend is not corrosive, The solution may be alkaline or acidic and may cause skin irritation.
6. Use a large stirring spoon to mix the nutrients and, when necessary, pH adjusting minerals in the reservoir. DO NOT USE YOUR HANDS. Read and follow all safety instructions on the pH and Mineral Solution labels.

Visit the Tower Garden Channel in Youtube to check how to assemble your tower.

2. What is Included with your Tower Garden Kit?

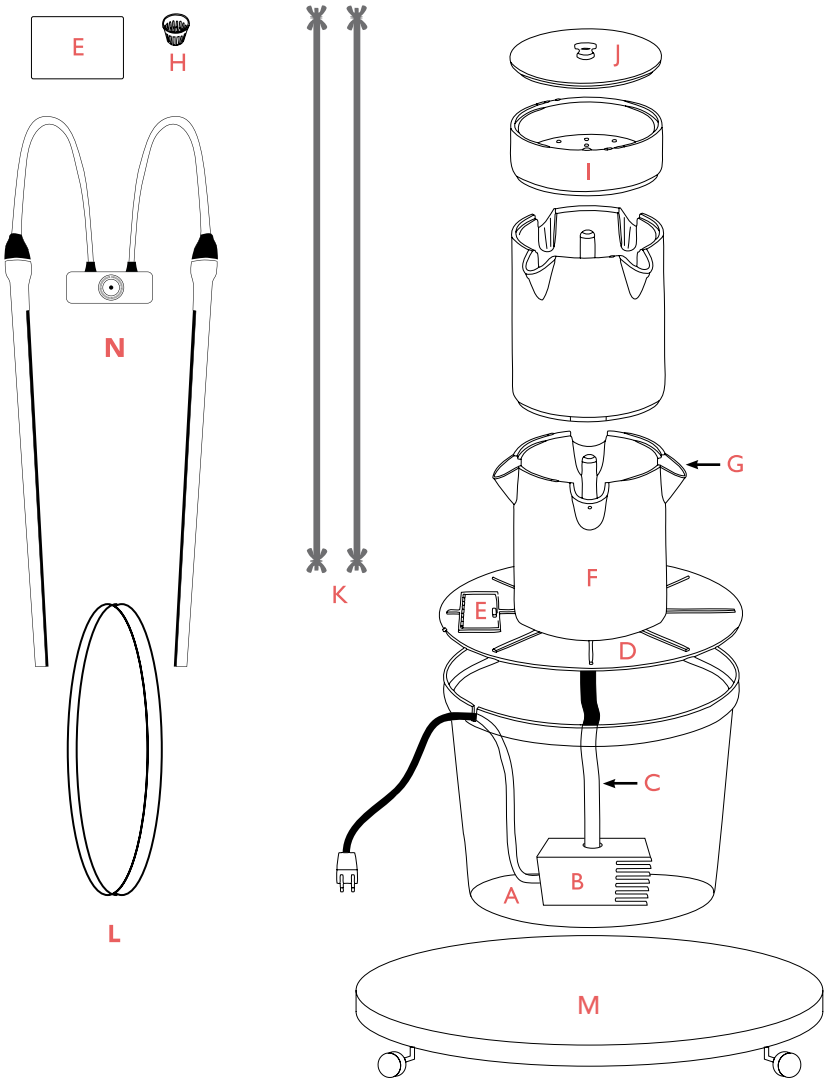
As part of your kit, you will receive a total of 7 boxes. Whether you are working directly with a community member or with us at FoodShare, we recommend that you handle all the boxes with care as some items contain fragile material such as the grow lights bulbs, which can break if handled incorrectly.

We also recommend that you make sure the staff in the front office are expecting the delivery and the number of boxes arriving. Dedicate a space in your school/community area to store all boxes that is at least **40" wide x 47" length x 32" height.**

- **A** Nutrient Reservoir
- **B** Pump
- **C** Swivel Hose
- **D** Reservoir Lid
- **E** Access Port Lid
- **F** Tower Sections (5)
- **G** Growing Ports (20)
- **H** Net Pots (20)
- **I** Shower Cap
- **J** Shower Cap Lid
- **K** Rods (4)
- **L** Cage Rings (3)
- **M** Reservoir Trolley
- **N** Light System

Also Included:
- Tower Tonic
- pH Supplies
- Seed Starter Kit
- Timer
- Drain pipe
- Measuring Cup

No tools required.



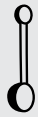
**Remember: Both old and new light systems work with any Tower Garden.*

3. What is NOT Included with your Tower Garden Kit?

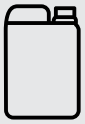
There are some additional supplies that may be required in order to work with your Tower Garden. These supplies are by no means obligatory, but they will help you keep a clean, safe and healthy environment with your students or participants.

Safety Goggles
x1

Rubber Gloves
x1

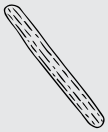


Long Handle Spoon
x1



Measured Jug
x2

Bucket
x1



Popsicle
Sticks

Towels
x1

Spray Bottles
x3

- Use safety goggles, rubber gloves and handle spoon for handling nutrients and pH solutions
- Use measured jug/containers for filling reservoir - usually 2x 10L jugs from any supermarket
- Use 3 spray bottles: one for water, one for diluted nutrient solution and one for insecticidal soap spray
- Use bucket for soaking rockwool and zipties to further secure grow lights to support cage
- Use pliers for shut down/clean up of tower if needed
- Use popsicle sticks for identifying plant names, date planted and/or student's name
- Cloths/Towels to wipe down tower

For replenishing supplies beyond the first year (depending on usage in first year): rockwool, seeds, nutrients, pH tester drops, vermiculite will cost approximately **$50 - $100.** Check out **http://www.towergarden.ca/shop** or find a local hydroponic store in your area.

Remember to check in with your school or community staff to support the cost of your program.

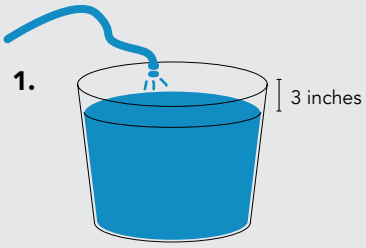
4. Filling the Reservoir and Working with Nutrient Solutions

It's important to always know the amount of water you're adding each time, as you'll use this measurement to determine how much nutrient solution to add. The ratio measurements can be found on the back of the jugs. Calculating the ratios and translating different units of measurement is a great activity to link to math and science.

We recommend using a refillable jug that you know the capacity of. For example we use an 18L water jug from the grocery store. If you can, leave your refilled jug of water out overnight without a lid or cap to help dechlorinate but don't worry, water straight from the tap is also fine.

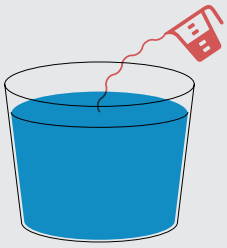
Here are the steps for filling up your reservoir the first time:

1.



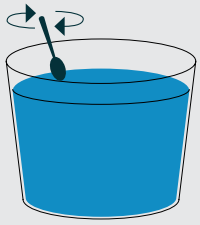
Use a hose or water jugs to fill it up almost to the top. Make sure you leave at least 3 inches from the top lid to avoid water from spilling through the hole at the top of the reservoir

2.



Add 200 ml of each mineral solution A + B. (Follow the instructions listed in Pg 8 of your Tower Garden Set up and Growing Guide)

3.

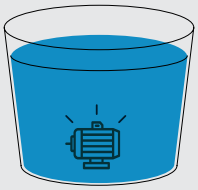


Use a long spoon or other utensil to stir in the nutrients thoroughly.

4.

Use the pH tester kit to test the pH of the solution in the nutrient reservoir. The optimal pH is 5.5 to 6.5.

5.



Plug in the pump. Check that water is flowing out of the top of the Tower Garden before putting the lid on the shower cap.

If you are refilling the reservoir, with a 18L jug, we recommend using 95 ml of each A + B mineral solution on a weekly or bi-weekly basis. Similarly if you are using containers of 20L each, you may use 100ml of Tonic A + B

5. What are the A + B Nutrient Solutions?

"One of the questions we get often as educators is, what are these A + B nutrient solutions? Are they safe?"

They are a mixture of minerals and nutrients that mimic what soil would naturally be producing for the plants. So although they aren't toxic or corrosive like some chemical fertilizers, they still aren't safe to ingest.

We suggest purchasing rubber gloves and even safety goggles to use when handling the nutrients with participants if you can. Store the nutrient solution somewhere safe and out of reach of little curious hands!

Here's a quick step-by-step on adding your nutrients to your tower:

1. Start by unplugging your water pump, to ensure concentrated nutrients don't get pumped up to the plants and harm them.
2. Add any extra water using a measured jug or bucket to the reservoir.
3. Put on your safety gloves + optional goggles.
4. Measure out the amount of nutrient solution A you want to add based on how much water you added, and pour into reservoir.
5. Stir with a non-metal spoon.
6. Repeat for nutrient solution B
7. Turn the water pump back on.

6. Working with ph Levels

Checking the pH levels can be a fun and easy activity for kids and adults alike. Whether once a week or once a month, having participants check on and adjust the pH level is an easy, colourful link to subjects like math, science, and even art!

Checking the pH levels is important to measure how well your greens do over time. Consider keeping a pH level chart in the classroom or community space (hopefully it will always be some shade of green!). Read the instructions that come with your pH kit to learn more.

Note: When working with pH test kit, we suggest that younger students/participants handle mineral solutions with supervision. Similarly, we do not recommend using metal cups or utensils when working with the nutrient solutions A + B.

Check out our Step-by-Step guide sheet in the Toolkit section for more information.

7. Know Your Audience

As a teacher or community educator it is important to know who are your students/participants and how will you be working with them.

Here are some tips for assembling the tower with participants of all ages:

K - Gr.5

For grades kindergarten to grade 5, students can help assist in the build of the main structure of the tower and attach pre assembled lights.

If possible, divide youth into smaller groups and activity stations, such as seed starting, along with the tower build, so they have more of a chance to interact with the tower as it's being built.

Gr.6-12

Grades 6 through 12 can help to assemble the lights and the tower as a group with less direct support. Divide into smaller groups and get students to take roles and responsabilities. For instance, some students can take roles of guiding the process while others can assemble the pieces together.

Adults

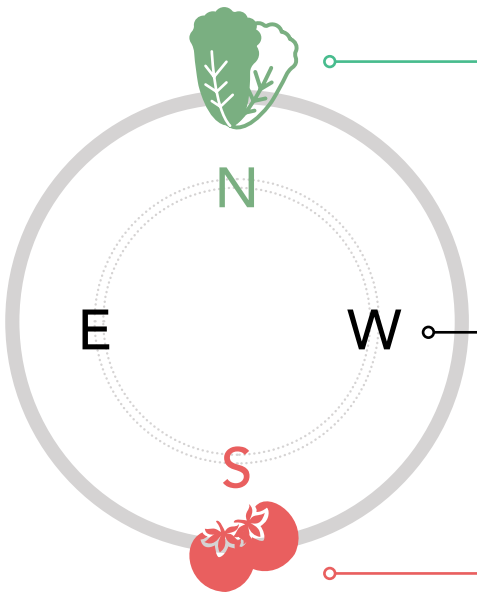
Adult community members can watch the instructional videos and assemble the tower with little to no guidance, and can be used as a team building activity that will help to foster ownership of the towers.

When building the Tower Garden, we recommend that you start the seeds with students. This will help them make connections between what will be grown and where.

Check out our pH Tracker Template in the Toolkit section to track your tower's development with students.

8. Placement & Directions

The first thing you want to consider is choosing where to place your Tower Garden. Even though your tower comes with grow lights, placing the tower near windows and natural light will aid in your tower growth.



If you have a north or east facing window, it will be much cooler, so it's best to stick to leafy greens, which are often referred to as "cool crops".

West facing windows are the second best for light/ heat.

A south-facing window is ideal for growing tomatoes, cucumbers, basically any 'fruiting' plant, as they require more heat and more light.

It may take a little experimenting to find the right plants for your unique space. Try to rotate the tower so that all plants receive natural light if possible.

It is important to note that the tower does not require natural light. So whether you have a classroom with no windows or little access to natural light, that's ok. These towers were designed to grow food in out-of-natural-light conditions.

Tips for location and directions:

- Make sure you have access to a water source nearby.
- An electrical outlet is preferred over a long extension cord.

Check out our Site Visit Checklist Document in the GFM Toolkit to assess your space for the Tower Garden.

MANAGING YOUR TOWER GARDEN

Managing your Tower Garden is extremely important to keep your plants healthy and create strong connections between your students/participants, family, friends and the broader community. Our tools and strategies will help you better manage your Tower Garden in a variety of settings whether it is in a classroom, at a staff meeting or community event.

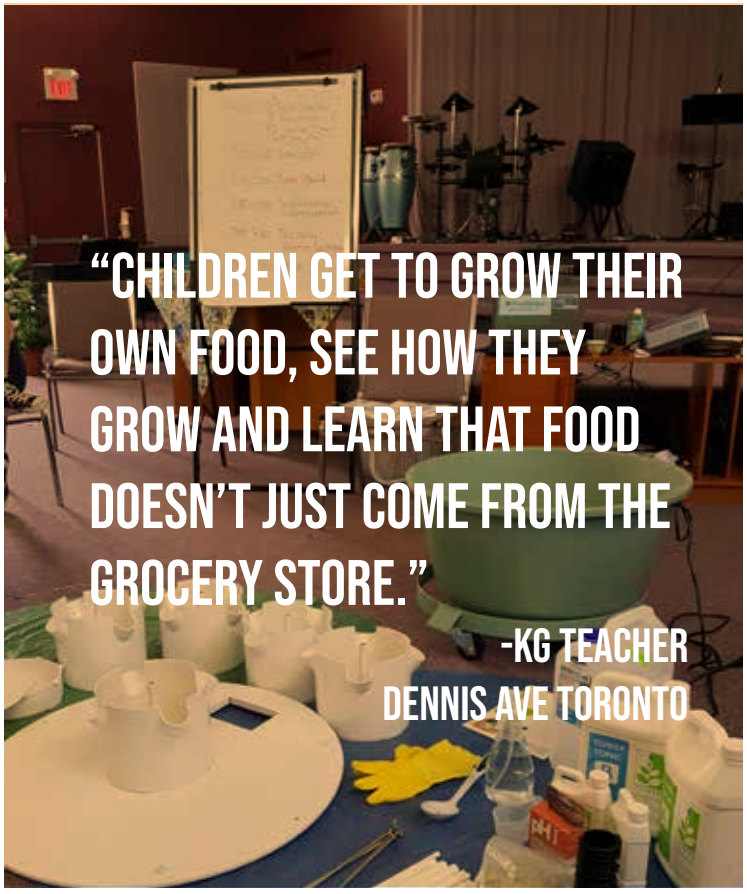
1. Selecting Tower Garden Champions

To run a successful GFM program, you need at least 2 champions at your school or community centre to ensure that towers are properly maintained (maybe that's YOU!). But Champions also need to connect with the broader community to help maintain the Tower Garden, especially in case of emergencies or holidays. Find caretakers, other teachers or admin staff that can contribute to check water levels, seedling trays and timers.

A good way you can get others on board is to host an orientation session. It can be during lunchtime or after school. Make sure to introduce the Good Food Machine to staff who are not aware and find those in the broader community who can support the maintenance and success of the Tower Garden.

Here are a couple of tips to get started:

1. Talk to your staff, school community and make them aware of the Good Food Machine program either through staff meetings or school assemblies.
2. Talk to your caretaker(s) and introduce them to the Tower Garden. Make sure they understand the how the Tower Garden works including the hardware and plant troubleshooting. (Refer to troubleshooting)
3. If you are working with older students, you can incentivize them to become Tower Garden leaders by using their volunteer hours. For younger students you may create roles and responsibilities with cool sounding titles like "Tower Champions" or "Growing Gurus" to get kids connected and feeling proud about their involvement.
4. Connect completing tower maintenance tasks with a points system you've already established in your classroom, or have points associated with "garden bucks" that they can work towards earning in exchange for taking home free produce once tower is ready to harvest.
5. Ask around and find out what other schools are using the Tower Gardens. Make connections and hear their learning experiences. A good way to not re-invent the wheel.

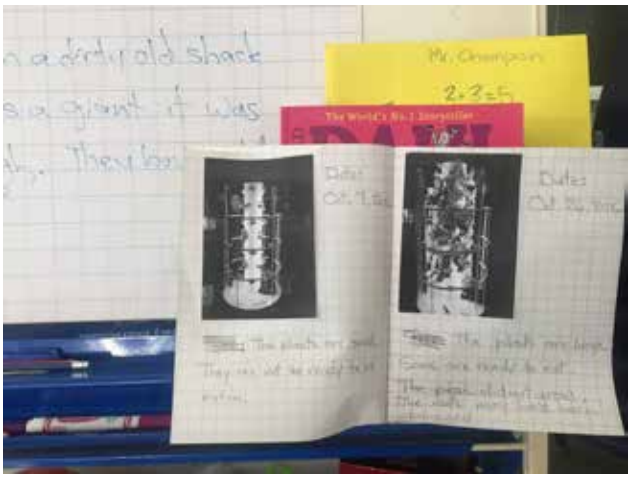

“CHILDREN GET TO GROW THEIR OWN FOOD, SEE HOW THEY GROW AND LEARN THAT FOOD DOESN’T JUST COME FROM THE GROCERY STORE.”
-KG TEACHER
DENNIS AVE TORONTO

2. Scheduling Suggestions for Tower Garden Maintenance

Assigning specific tasks to students or community members can help create a stronger sense of ownership. Dedicate tasks to students or colleagues such as checking the water levels, pH levels, pruning or general cleaning.

One quick and simple tool that you can use is a white board or chart paper. You can set up a calendar with weekly or bi-weekly, check-in times/dates or write down any updates that other people can see. Create fun visuals with images and quotes so that the school or community can learn about this exciting project.

Here are a few examples of our GFM alumni schools:



Here's a quick list of some of the basic maintenance needs of your Tower Garden, and how frequently you/your class should be performing specific maintenance tasks. This may help you divide responsibilities amongst different classes/students/teachers.

Tasks	Suggested Frequency	Action
Checking for mineral build-up	Once per week	Check around edges of plant pods, water reservoir, top of unit for traces of mineral build up, wipe away with damp cloth and vinegar spray.
Check for pests	Once per week	Check underside of leaves and stems for signs of pests such as tiny eggs, small holes (whiteflies and aphids mostly) and spray with garlic soap spray (recipe provided) as needed.
Remove dead leaves	Once per week	Check each plant for dead leaves and trim/remove for optimal plant growth.
Taste test plants (as growth increases)	Once per week	Sample leafy plants by harvesting a few leaves. Check for any off-taste or bitterness.
Measuring Plant Growth (optional)	Once per week	Measure length of leaves and height of plants as part of an ongoing log to see how fast plants are growing.
Turn on fan	Once every 1-2 weeks	Set fan up to blow on plants for a few hours. This helps prevent mould/ fungus. It provides wind resistance and stronger plants. **Students can also tap the plants to mimic natural wind in nature!**.
Starting New Seedlings	Once every 3 - 4 weeks	For continuous edible greens start new seedlings (lettuce greens) every 3 weeks to replace old/harvested plants from Tower Garden. Plants like herbs, kale, swiss chard and collards will have longer tower life, but lettuce/arugula/ spinach will have a life of 3-4 weeks or 2-3 cuttings.

Check root growth of seedling in tray (if applicable)	Once every week	Gently lift rockwool to see if roots have begun to poke through the bottom. Seedlings are ready to move to the tower when roots grow at least one inch from the bottom of the rockwool.
Check for too-long roots	Once every 2 weeks	Check the inside of the reservoir for roots that might be getting too long and could clog the pump. Trim long roots that are getting too close to the pump or are starting to wind around the inside of the reservoir base.
Check water levels	Once every 2 weeks	Open reservoir lid to see if water levels look like it is at the the half-full level.
Add water to reservoir	2 - 3 weeks/ whenever reservoir	Fill up jug or bucket with water and leave out 24 hours to allow chlorine to evaporate before adding to reservoir if possible.
Add nutrients to reservoir and check ph (optimal ph is 5.0 - 6.5)	2-3 weeks (or any time you add water/get an "off" ph level reading)	If starting with brand new seedlings, ratio of nutrients to water is 200 ml of solution A + B (each) to full reservoir (20 gallons) or 95ml of solution A + B (each) per 18L jug if plants are full size already.
Drain and clean unit	Once per semester	Drain tower (using clear hose extension at the top of the tower to help pump water easily out of the unit). Turn pump off, take tower apart, dump remaining water out, clean reservoir and then fill with warm soapy/vinegar water, soak all components in reservoir and clean thoroughly. Put tower back together.
Clean water pump filter	Once per month	Remove side cap from the water pump and take out filter. Make sure all debris is properly cleaned. Place filter back in pump and fit in side cap. Make sure pump is properly closed.

Check out our Schedulling Suggestion Guide in the Toolkit section to keep your Tower Garden healthy.

TROUBLESHOOTING YOUR TOWER

As part of the Good Food Machine program, you will encounter issues with the Tower Garden including hardware troubleshooting (i.e., light replacements, light and pump timers, power bar connections, etc) and growing and harvesting troubleshoots (i.e., algae and mould, rockwool re-use, overcrowd pods, etc).

This troubleshooting section will help you run your Tower Garden smoothly throughout the program year and invite others to support your process.

1. Working with Nutrient Solutions and pH bottles

In **Assembling Your Tower section**, we talked about what A + B mineral solutions are and how safe they are in your Tower Garden.

First let's go over a few safety tips before using the acid and base bottles. One thing to consider is that these bottles are indeed corrosive and toxic. We strongly recommend that you or other trained staff use the bottles in a safe environment and keep it away from children at all times.

However, what happens when your ph levels are off and you can't seem to find the appropriate grade between 5.5 and 6.5? How would you use the acid and base solutions that come with the Tower Garden kit?

Here are a few steps to level off your Tower Garden pH levels:

1. Shake well before using.
2. Always wear rubber gloves and appropriate eye protection when handling.
3. If your pH level is above 6.5, add 5ml of acid until you reach the desired state.
4. If your pH level is below 5, add 5ml of base until you reach the desired state.
5. Stir every time you add acid or base to your Tower Garden reservoir and recheck pH levels using your pH kit.

2. Identifying Troubles with your Plant Growth and Harvest

There are lots of ways to visually check how your Tower Garden is doing. One is by checking that all your hardware connections are in place so that you keep your tower running. Another is the growing and harvesting stages, including looking at the leaves, stems or shoots. Here are a few tips in recognizing and troubleshooting your tower and plant growth and health.

Green Rockwool Pods

If your rockwool is starting to turn various shades of green, it could be that your plants are getting too much water and not enough time to dry out, or that there is not enough air circulation, causing algae or mould to build up.

1. Try placing a fan somewhere near the tower and leave it on for a few hours each day, or even overnight if that's the only time that works for you. Don't have it too close if its a powerful fan! Rotate which side of the tower the fan hits so the whole tower benefits. You can also remove some overgrown /dead leaves to create more airflow.
2. Check to make sure that your water timer is set to 15 minutes ON, 45 minutes OFF, and that the switch on the timer face is switched to the "timer" setting.

Is it Mould or Algae?

It can be scary when you see your rockwool turning different colours and not knowing whether it is a dangerous mould occurring or harmless algae. Mould will often appear as either dark, almost black, or white/powdery, whereas algae tends to be a very deep green. Algae is what you will experience most often. If you're unsure if you've got mould or algae, you can always remove that particular pod/plant just to be safe.

Overcrowded pods

It's very easy for little hands to plant too many seeds in the rockwool pods when starting seedlings. You'll need to thin seedlings out as they start to grow, or run the risk of having all seedlings in the pod die from overcrowding. If possible, have an adult or older youth handle small seeds, and leave larger seeds for smaller hands or assist younger students.

We recommend thinning your seedlings before they go into the tower! Here's a general rule of thumb for how many plants per rockwool pod you can/should have:

1. Small leafy greens: lettuce, spinach, arugula, basil, parsley: 2-3 plants per rockwool pod
2. Large greens: Kale, Swiss Chard, Bok Choi: 1-2 plants
3. Fruit Bearing plants: Tomato, beans, peas, peppers, cucumber etc: 1 plant.

Overgrown Tower

Even though it might look exciting to have a full tower, it's also a sign that you probably need to be harvesting more often! Leaving plants to get too big can cause leaves to touch and be burnt by the grow lights, and can result in leafy greens turning bitter as they get tough if left unharvested for too long.

DON'T HESITATE, HARVEST! Harvesting often is the best way to make sure you use your greens before they get bitter. Also, check to make sure you move or remove any leaves that are touching the grow lights to avoid them getting burnt and inedible. Also the more overgrown your tower is, the less likely you'll notice a lot of the dead leaves beginning to form underneath new growth. Check and remove dead leaves often to avoid mould and unwanted smells.

Overgrown Roots

Over time, roots will start to grow down into the reservoir, and could compromise the water pump.

We recommend checking the reservoir regularly for signs of extra long roots and trim accordingly. You can use the root trimming as a teachable moment for the students/participants, especially when it comes to cucumber roots, which actually SMELL like cucumber!

Please refer to our Troubleshooting Infographic in the Toolkit Section and pin it next to your Tower Garden.

3. Hardware Check-ins

You may run into situations where a light bulb goes off, or your water pump is not working. Don't worry, it may be a minor problem that can be easily fixed.

Here are a few things to consider:

Water or Lights Timers not working properly

It's very easy for kids and adults to mess around with the timers by accident, so it's important to check regularly to make sure lights and water are functioning properly or else your plants may be suffering and you don't even know it!

If you are using a power bar with side timer: Make sure the water timer (grey) cord is plugged into the timer side of the power bar. The water timer has a switch on the front that should be set to the "timer" position, otherwise it will be "on" all the time, leaving no breaks as needed.

Lights timer (white) cord should be plugged into the on side of the white power bar. The lights timer wheel has a little black arrow which should always be pointing to the correct time of day, otherwise the lights may end up running all night instead of during the day, if the timer is set to the wrong hour. If the lights are on at night, the plants get no night time relief (they need to sleep too!) and their growth will suffer as a result.

Cleaning up the water pump

Just because we don't see the water pump doesn't mean it doesn't need a little bit of maintenance. The pump filters any debris that falls in the water from the roots. As the pump accumulates debris, it could get clogged if it's not cleaned at least once in a month.

Here is a step-by-step on how to clean the pump:

1. Turn off or unplug the water pump.
2. Remove all connections and take the pump out of the reservoir.
3. Remove the side cap. It may take some practice to open.

4. Remove the filter from the inside and give it a thorough rinse. Make sure all debris is off.
5. Place filter back in the pump and close the lid.
6. Connect the hose and place it back in the reservoir.

Reusing Netpots

As you grow and harvest, you may use your plastic netpots over and over again. The netpots have been designed so that you can re-use them after you have completed your harvest.

Here is a quick step-by-step on how to make sure you can re-use them properly for your next seedling:

1. Remove all greens and roots from your previous harvest.
2. Make sure you rinse off any nutrient residue that may have accumulated throughout your growing and harvesting period.
3. Once cleaned, snap it back in the tower and include your next seedling.

Light Fixture

Ensuring that your lights are working properly will provide your greens with the right amount of lighting to grow healthy plants. Make sure to always unplug from the outlet and allow to cool before handling or replacing your lights. Consider the following:

- If none of the lights are on first ensure the plug is in the power strip or that the red switch on the power strip is on and working.
- If one or some lights are not on, remove power connector to allow bulb to cool down before handling.
- Ensure that the power connector(s) is securely plugged into the light. Connectors tend to loosen over time, you can use a sturdy tape to hold in place.
- Check to see if the light bulb is rotated in the fixture properly or remove the bulb to try it in another fixture.

Note: If you have an old light fixture like the one above and would like a new replacement you can contact direclty our team at **goodfoodmachine@foodshare.net**

4. Troubleshooting Tips

Watch for salt/mineral residue build up along bottom water tank and in plant pockets. Use vinegar or warm water on cloth pad/scrub to remove on a weekly basis. A good tip is to get your students/participants to recognize residue and make it into a habit.

After plants die off, remove rockwool pod, clean it with water and let it dry out. Reuse pods that are in good condition. Pods can be broken up into smaller pieces and used in lieu of vermiculite topping when starting new seedlings in new rockwool pods.

You don't have to fill the reservoir until seedlings are ready to transplant, with roots poking through the bottom of the rockwool. You can leave the seedling tray on top of the reservoir and leave lights on 14 hours/ day as you normally would once seedlings are actually in the tower. Spray seedlings thoroughly 1-2 times daily and fill seedling tray with ¼ inch of water on Fridays to last over the weekend.

Avoid introducing outdoor plants into your Tower Garden space to reduce risk of pests like aphids. If you encounter any pests, please use our **Natural Garlic Soap Recipe** in the toolkit section.

Please refer to our Troubleshooting Infographic in the Toolkit section and pin it next to your Tower Garden.

5. Cleaning/Shutting Down Your Tower Garden

Whether you are shutting down for holidays or at the end of the school/program year, we recommend doing a thorough cleaning so that you can keep your tower ready for next semester or year.

Please follow the following steps when cleaning your Tower Garden:

Disconnect the pump and power before starting the cleaning process. Put cables aside and away from the tower garden.

Dismantle the Tower Garden by starting from the top sections to the bottom. Make sure to remove cage and put aside.

Remove all extra plants and netpots from each tower section. *Note that Some sections may be stuck due to the nutrient solution.*

Place all tower sections aside and clean them thoroughly with soap and warm water. This also includes pump, reservoir lid and hose.

Make sure to remove any excess water from the reservoir and wipe with a damp towel. If possible roll the reservior outside if possible to dump water.

Place everyting inside the reservoir if possible, clean the surrounding areas and store in a secure environment.

2.

GROWING & HARVESTING

GROWING WITH THE TOWER GARDEN

1. What is Rockwool and Vermculite used for?

Rockwool cubes are made from eco-friendly rock fiber material called basalt rock (a volcanic rock) combined with limestone. These soilless seed starter cubes provide plant roots with oxygen and consistent moisture, encouraging rapid, healthy growth. You'll get a year's worth of supplies including 20 rockwool cubes with your Tower Garden Growing System. But you can order more after your initial growing season.

> *Safety considerations when working with rockwool:*
>
> *While rockwool is safe to handle, students with severe allergies or asthma should wear a mask or may want to skip the seed planting activity as it can irritate eyes, skin and lungs.*

Vermiculite is the name of a hydrated laminar mineral (aluminium-iron magnesium silicate). Vermiculite added to the rockwool pods increases water and nutrient retention and aerates the soil, resulting in healthier, more robust plants. You will get a bag of vermiculite with your Tower Garden Growing System.

The bag of vermiculite can last for two to three school years, depending on the amount used. Rockwool cubes can be re-used as vermiculite substitute. Used rockwool can be washed and dried before tearing into little pieces.

2. Seed Starting Considerations

It is important to note that you may want to supplement the seeds provided in your Juice Plus starter kit with additional types of plants. Here are some tips on how to choose which types of seeds to purchase:

1. Consider the cultural diversity of your group. Ask participants what kinds of foods/herbs they eat in their traditional cooking.
2. Almost all plants come in a variety of types, colours and sizes. Consider purchasing a wide variety of a single type of plant that you know will do well in the tower, for example basil or lettuce. Although you'll be growing a lot of the same plant, the sheer variety will help participants learn about biodiversity.

You'll notice the Juice Plus videos showcase a lot of outdoor growing scenarios. Because you'll be growing mostly indoors (and in Canada!) it's best to stick to leafy greens and non-fruiting plants, as you may not get enough light, heat, or wind to sustain plants like cucumbers, tomatoes, peppers, etc. If fruiting vegetables, no more than 1-2 as it takes a lot of space. Schools have had success growing tomatoes and cucumbers.

But that doesn't mean you can't experiment! Try your luck with a variety of plants and see what does best. Here's a list of what WE recommend growing in your indoor tower:

Arugula, Asian Greens, Basil, Bok Choy, Chives, Cilantro,Chamomile, Collards, Callaloo, Cutting Celery, Dill, Kale, Lettuce, Mint, Mizuna, Mustard Greens, Oregano, Parsley, Radicchio, Sage, Sorrel, Spinach, Swiss Chard, Thyme

3. Planting Seeds

When planting into soil, a general rule of thumb is to plant the seed 2 times the depth of its body length. For instance, if a seed is 2mm long, you would plant it 4mm in depth. The rockwool pods all have the same hole depth, so to compensate, we control how much vermiculite we add to cover the seed. Basically, the bigger the seed, the more vermiculite we use. Cover larger seeds to the top of the hole, smaller seeds should be covered half-way.

Here are some good tips for starting seeds when working with participants:

1. If you are working with younger students, make sure to control the number of seeds that are placed in each rockwool cube. This will prevent your seedlings from overcrowding.
2. Thoroughly soak rockwool cubes in a bucket of water and let it sit on the plastic containers.
3. Get participants to label your seeds by plant type or by name of participant and the date they were planted. This will help you keep track and again will help participants take ownership over the plants. We recommend using wooden stir sticks, or popsicle sticks but you can use plastic tags too.
4. Once your seeds are planted into soaked rockwool cubes, buy a spray bottle and have participants spray the tops of the rockwool once or twice daily, as spraying is less disruptive to the seeds. You can still fill the seedling tray with water along the bottom, but until the plant grows enough roots to reach the bottom, it's a good idea to spray the tops of the rockwool too.
5. Add about ¼ inch of water to the tray on **Fridays** so seedlings will survive over the weekend. Leave your tray on the reservoir lid to receive light directly from the towers. Do not leave tray on a windowsills during cold weather.

Visit our Planting Seeds Guides sheet in our Toolkit section for more information.

4. Transplanting Seedlings To The Towers

At this point you and your students/participants have been taking care of the seedlings and you are wondering *"how do we know when they are ready to be transplanted into the tower?"*

Transplanting usually happens **3-4 weeks after planting the seeds**. This will depend on the amount of water and light your seedlings receive, and how warm your space/classroom is.

Here is a quick step-by-step process in how to properly check and transplant seedlings into the Tower Garden:

Look underneath the rockwool cubes and check for grown roots. The roots should be at least an 1-2 inches in length.

When you are ready to transplant with student/participants, make sure they separate the rockwool cubes with care as some seedlings can get tangled with others.

Place one rockwool cube per net pot. Remember to diversify your tower with different produce (1).

Finally, make sure the roots of your rockwool touch the bottom of the mesh cups. This will allow the roots to get all the necessary nutrients from the water.

1. Planting Seedlings Tower Garden Video

5. Growing in Canada

There are some great growing videos online through **Juice Plus Website** but one of the biggest differences between the Juice Plus growing videos is that they are targeted to more southern climates or warm-growing seasons. They showcase vegetables and fruits which require more sustained light and heat conditions in order to grow to full maturity. Our classrooms in Canada may not have the right conditions for many of their suggested plant options.

Here are a few considerations for growing with the tower in our more northern climates:

- As part of your starting kit you will get a series of warm-season veggie seeds such as eggplant, cherry tomatoes, cucumber and peppers.
- These "hot crop" plants may not do as well in your indoor growing environment depending on various factors including temperature, humidity and amount of natural light.
- You may want to purchase additional cooler-crop/leafy green seeds such as lettuce, kale, spinach, swiss chard and arugula which will thrive in a cooler, lower light environment.
- If you are planning to grow hot-crop/fruiting veggies, we strongly recommend placing the Tower Garden near a south or west-facing window. The natural sunlight will help fruiting plants to get the most light possible.

Don't let us discourage you! We have found that some teachers within our Good Food Machine program have had success growing fruiting veggies such as tomatoes, and cucumbers. We welcome you to experiment as much as possible in your class or community space.

HARVESTING FROM THE TOWER GARDEN

Well by this point you should have your seedlings placed in your tower and everything is growing great. Now it's time to harvest!

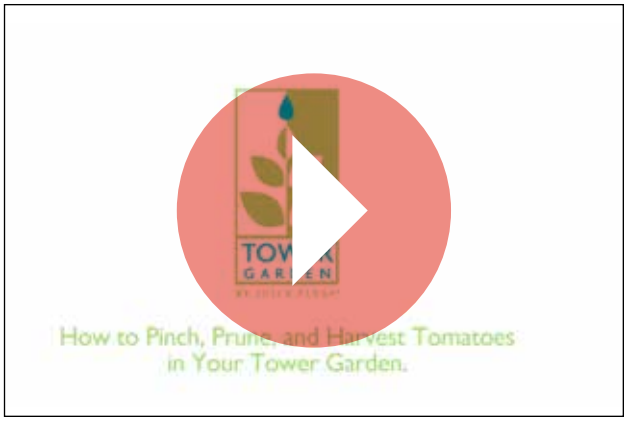
How do you know when your plants are ready? Whether you are working with students or community members, beyond checking for size, you can do a taste test! Get students/ participants involved in understanding the difference between checking for bitterness and toughness. These are both signs that your plant is overgrown and needs to be taken out and replaced with a fresh seedling.

You will notice that not all produce will grow at the same rates. Some leafy greens such as lettuce, spinach and arugula will take a shorter amount of time to reach their desired state, while basil, chives, dill and other herbs will take longer. Nonetheless, herbs will most likely last longer in your Tower Garden than leafy greens.

So, just how long then will plants last in your tower? Here are some quick tips to differentiate your greens:

- Delicate leafy green plants like lettuce, arugula and spinach will yield 2 harvests and last around 2-3 months
- Heartier leafy greens like kale, swiss chard, collards and also herbs can last 3-6 months, and should be harvested from the bottom of the stem or outside-in.

For more information, please visit Juice Plus Growing Youtube Videos



1. Identifying Growth Cycles

As part of your starting kit, you will get a whole bunch of seeds that come with your tower. Here is some relevant information to understand the harvest cycles:

Lettuce: Harvest from bottom/outside first or mid-leaf for multiple growing

Loose leaf lettuce can be harvested by taking the outside leaves first, leaving the inside leaves to continue to grow. Alternatively, you can cut the entire bunch of leaves about halfway up their stems, and the plant will continue to grow new leaves from the centre stems that were left untouched. After a few harvests, leaves will become bitter and inedible. If plants are left unharvested for several weeks, the leaves will likewise become bitter, so don't wait too long! Lettuce has quick turnover, must be replaced every month or so.

Arugula: Cut from mid-leaf for multiple growing

Similar to loose leaf lettuce, you can cut arugula at mid-leaf level and the smallest/ centre leaves will continue to grow for potentially multiple rounds of growth and harvests. After about 3 cuttings, the arugula will become bitter and it's time to take out the plant and replace it. You can also harvest the plant like loose leaf lettuce by harvesting the outermost leaves first.

Parsley + Chives: same as Arugula

DON'T WAIT! HARVEST OFTEN, EVEN JUST TO NIBBLE!

Visit our How & When to Harvest sheet in our Toolkit section for more information.

Kale + Swiss Chard: Harvest from bottom outside first

Kale and Swiss Chard can last a few months in the tower if managed well. Harvest from the bottom of the plant and snap the leaves off near to the main stem by pulling them down and to the side. After about 2-3 months the leaves will begin to become bitter and you can replace the plant with a new seedling.

Nasturtium Flowers: Harvest flowers + leaves

Nasturtium plants are great because both leaves and flowers are edible and taste similar. Harvest flowers anytime, but only harvest medium to small leaves, because the old ones will get tough and bitter. This plant can last several months and will continuously bloom. They add a spicy flavour to foods such as salads.

Basil: Harvest bottom leaves or just above new growth

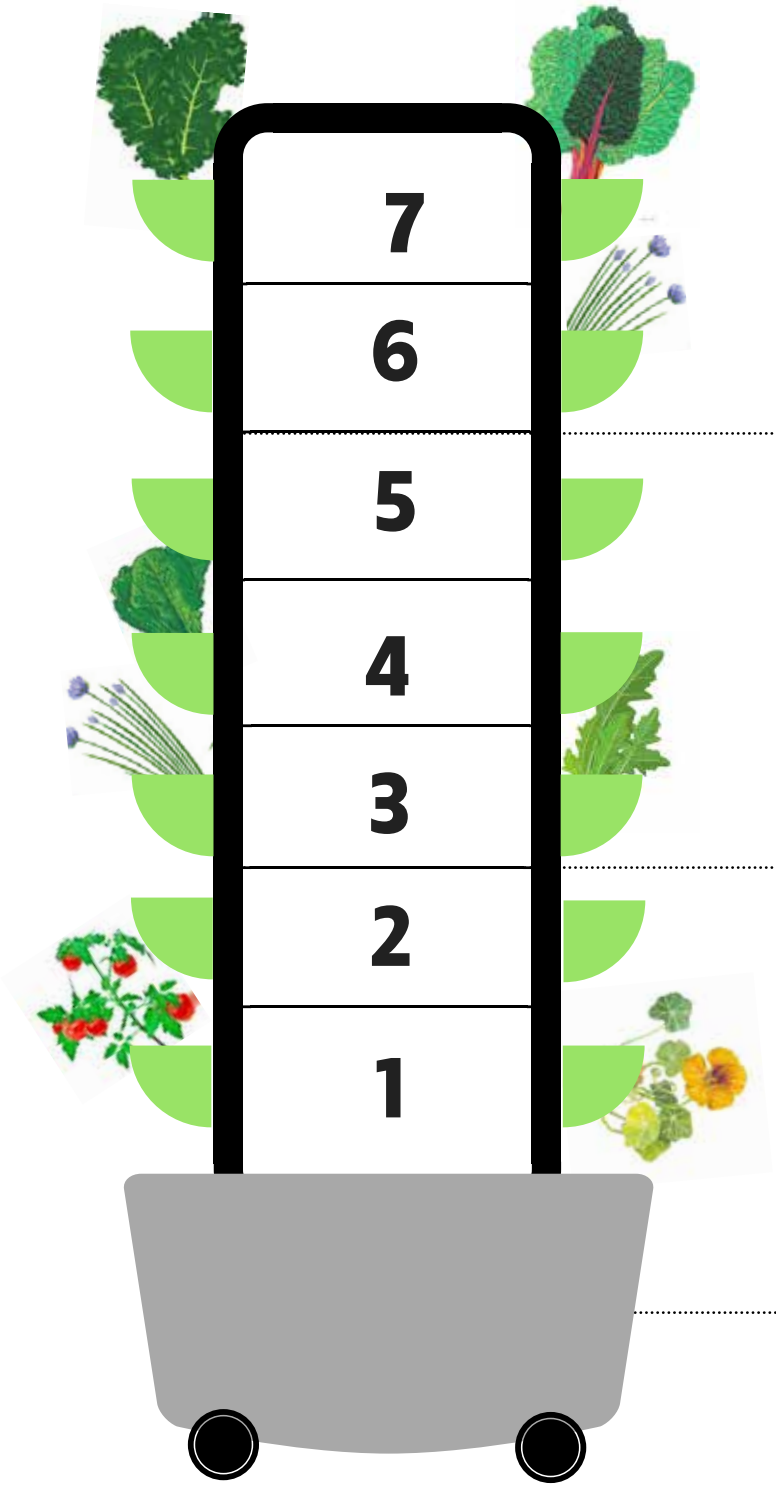
Basil plants are amazing growers and grow in stems of three. You can cut any one of the stems just above smaller new growth starting in the "armpit" of the plant and plant will send its energy into the new growth and keep on growing! You can also harvest leaves individually starting from the bottom and moving upwards. Cutting the stems will yield more growth and more harvesting from the plant over time.

Head Lettuce: Harvest as a whole

Head lettuce grows slightly differently than loose leaf lettuce. The type of lettuce will always be indicated on the lettuce package. Head lettuce will start to grow inward into a "ball" or "head". If you see this happening, you can leave this lettuce longer and then harvest as a whole head when it's large enough to do so. Some head lettuce is "looser" than others.

2. What to Grow Where?

Where you plant is important for the life cycle of your plants. We recommend using this guide for better positioning, growth and nurturing of your greens throughout your Good Food Machine program.



TOP TALL!

Kale, Swiss Chards, Borage, Parsley, Chives, Dill, Collard Greens, Eggplant, Oregano

MIDDLE SMALL

Lettuce Mix, Basil, Chives, Purslane, Arugula, Thyme, Pak Choi, Spinach

BOTTOM WIDE + VINING

Cucumber, Peas, Pole Beans, Head Lettuce, Cherry Tomato, Nasturtium, Mint.

3. Plants Going to Seed

Another fun activity that you can do with students/participants is let a few leafy greens go to seed so that they can see the whole life cycle of the plant and maybe even save some seed to use for next round of tower growing.

Since you are growing in the Tower Garden, certain plants will not be able to sow themselves as they would normally do in outdoor gardens. Therefore, it is important for you to remember to isolate different plants during the seed harvesting. This will prevent seeds from mixing and/or crossing.

There are a couple of ways that you can identify when your greens are going to seed:

1. Greens will automatically change flavour - particularly towards bitterness. This is a sign that your plants are in transition between prime state to seed.
2. Another way and most common is when plants enter the flower stage in preparation for seed production. Many vegetables, greens, herbs and roots in particular, are past their prime for eating when they reach this stage of growth. They tend to be tough, woody or bitter. The usefulness of some crops, such as basil, can be prolonged somewhat by cutting back to promote new growth.

Remember that during this stage you can invite students/participants to explore and experience the transition by doing a taste check, taking pictures, sketching the flowers, collecting seeds and even creating a seed library for your school/community environment.

4. Throwing a Salad Party

When you've got a full tower that you need to harvest and feel overwhelmed, we suggest hosting a salad party for your school or community group!

If you've only got a few things growing in your tower, participants can use individual leaves of plants to test out dips or dressings that they've made themselves. There's always a way to make the most of your tower's growth so don't let those greens go to waste!

Here are a couple of tips on how to make this happen:

1. Invite teachers, principals and other staff to come to a harvest day party. Make sure you get them excited to harvest with students.
2. Set ingredients on the table and make sure students and staff understand what is growing in your tower.
3. Pick a salad dressing recipe of your own and get students to make it with you.
4. Make a panel of judges (i.e., TPH nurse, student nutrition rep, principal, student or teacher) and have students plate up small portions of their salad with dressing for the taste test. Get your students to describe their creations, how it was prepared and why they chose to do it that way.
5. Review the waste generated by throwing into the organic bin after workshop
6. Don't get stuck with all the dishes. Get students and staff alike to end with a group clean-up.

If you would like to get more information you can check out our Signature Salad Workshop in the Toolkit section.

5. Kitchen Etiquette

If your school or community centre has access to a kitchen, we recommend using this Kitchen Etiquette with your students or participants. It is important to remember that in well-run kitchens, you will find a solid team of members who know their roles and responsibilities. Whether they are preparing ingredients, cooking dishes, transporting, serving or cleaning up, you find a clear sense of cohesion.

The same goes for your kitchen-based activities! Here are a few guidelines to follow:

Let's talk about mise en place.

Mise en place means 'everything in its place'. This means everything from cutlery, plates, pots, pans, ingredients and other tools as well as people are where they need to be and in the best condition to do the job. All chefs learn this at the beginning of their careers and it guides most of their behaviour inside the kitchen. When applied correctly, the concept works its magic in even the most stressful circumstances.

Initiative

While mise en place is about taking personal responsibility for each task you are given, sometimes things happen. You can be shifted to another task or asked to help someone else with their own, and may not get to finish your ritual. If you're working with the kitchen cart and see a mess in a shared working space, you are now responsible for cleaning it up. As a kitchen cart educator, if you see a mess, don't think about asking ,"Who made this mess?", but rather, ask "Why is this mess not clean?" In a teaching kitchen, promote the idea that your mess is my mess; i.e. it's our mess.

Communication

Communication and initiative go hand-in-hand: In the previous example, one team member letting another know that they have been re-allocated and that the task still needs to be done or even a quick check-in to ask if the team member is done with the used work space will make all the difference.

Cooperation

Just as there is no 'I' in 'team', there are no actual individuals in the teaching kitchen. It is not a place for ego. Individuals may have specific roles, but the goal is a collective one. You may have a short amount of time to complete your kitchen cart tasks - so cooperation is key!

Humor

While the food industry is known for its long hours, low entry pay and high turnover, your teaching kitchen doesn't have to replicate this! Instill a good sense of humour in your kitchen cart's space to keep the mood relaxed and enjoyable for your students.

Rituals

Instilling a sense of ritual, routine or expected schedules will help your teaching kitchen run like a well-oiled machine. Let students know ahead of time what they can expect from the session, what their role will be and what they need to achieve in the time allotted. This
applies, but is not limited to:

- Getting Started can take up a lot of time if your students don't know where to go or what to do. Make it well known the process they need to follow to get "suited up", hands washed,hair back etc to get them ready for a productive class.
- Allocating Key Tasks or Recipes will also help move things along. At the beginning of your session, split students into groups according to their roles or recipes (if you're making more than one). Carve out some time to read through the recipes in their entirety so they can ask questions (e.g. confusing terminology, measurements etc.) and get the big picture of what order things need to happen in before they launch in.
- Clean-up can be a drag. Try using the template provided and ask your students to fill in their names before you even start the session. This way they know what to expect and won't skip out just when you need them the most.

You can find a copy of Kitchen Etiquette Cleaning Sheet in our Toolkit Section for more information.


GOOD FOOD MACHINE


Water fountain

3.

PLAN & DEVELOP LESSON PLANS

OUR GFM STORIES OF SUCCESS.

1. Teachers Connecting The Tower Garden In Schools/Community Centres

Connecting the Tower Garden with your teachings is an important element for the success of your Good Food Machine program. To get you inspired, here are a couple of our success stories from other teachers and community educators:

Rosemary Tomlinson-Morris
Dennis Avenue School Toronto

Objective: Create a lesson plan that engages students to understand colour patterns based on different foods.

Learning Activities
Students learned about colour diversity by showcasing a variety of foods with different colours. Using the Tower Garden, students were able to perceive different shades of green

Agenda: Made lesson plan into weekly activities.

"Students were able to identify that stems are long and rectangular and leaves are round"

- Rosemary

MLSE &
FoodShare Toronto

Objective: Create a lesson plan that engages students to build critical thinking, math skills, active and recovery knowledge.

Learning Activities
Students work together to get answers to complete games. Groups work on problems and complete the physical activity (basketball and soccer) to make connections between sports and math.

Agenda: Made lesson plans into weekly activities.

"The one thing I've noticed that has changed is the amount of nibbling that has gone on. At first we would have so much produce left over; now they eat EVERYTHING"

- Teacher

Daniel & Jelena
Msgr.Fraser School Toronto

Objective: Create a lesson activity that engages youth in understanding the mechanism of a hydroponic tower system by creating a DIY toolkit that could be replicated and used in school.

Learning Activities
By using food safe pvc pipes, and reusable buckets, youth were able to explore connections between material waste, land use and access to vertical spaces. Teachers were able to combine design and built class with biology and science. It allowed students to compare and contrast the growth cycles between the hydroponic tower with the DIY tower.

Agenda: Made lesson plan into weekly activities

"I am cognizant that growing food does not require a lot of space but smart space. I can see myself growing things in my balcony now"
- MSGR Fraser Student

Roots to Harvest
Thunder Bay

Objective: Working with two local schools, RTH provide transformative educational opportunities by growing throughout school year and make connections in the summer by growing outside.

Learning Activities
Science and nutrition classes have adapted lesson plans to link with curriculum throughout the year. Participants explore plant biology and chemistry through the Tower Garden use.

Community educators engage parents and elders from the community to tell stories and teach young ones through storytelling.

Agenda: Participants engage on a bi-weekly to monthly basis.

"Students are actively involved in the planning, care and maintenance of the tower and it has become a continuing source of interest as students see the progress of each crop."
- Gerry, Alternative Education Teacher

2. Planning Workshops with Students and Participants

Depending on your student or participant needs, you may need to plan ahead a series of workshops or activities before engaging with the Tower Garden. From the moment you plant seeds with students to transplanting into the tower, it may take some time until you actually have food growing in your tower. What will you do in the meantime?

Here are some important considerations before you start engaging with students/ participants:

Think about your audience

Consider the needs and aspirations of your students/participants. As a teacher or community educator, you may already have a teaching plan for the school or program year. Try to identify the areas you think the Good Food Machine program can best work for them.

Define clear goals

Creating clear and specific goals can help you reflect your student or participants learning throughout the school or program year. We recommend creating specific, measurable, achievable, relevant and timed goals (SMART). One good example is selling produce from the tower at an event every 3 months or engaging parents or community members to share recipes.

Utilize your strengths

Consider the resources you currently have in your school or community setting including people who may support you along your program; intra and extra curricular activities; financial outlets that could be used for your program; and knowledge from friends or family that could be passed on to your participants.

Create a flexible agenda

Once you have identified a series of goals with your students or participants in mind, you can start developing an outline of how you will achieve those goals. Make it flexible and visible with your students so that you have a visual reminder.

3. Making Connections Between your Tower Garden and Lesson Plans

Making connections between the Tower Garden and teaching plans is important for the success of your Good Food Machine program. Note the Good Food Machine Growing & Learning Guide will connect multiple lessons to the grade 4-8 Ontario curriculum and will be ready to share in early 2019.

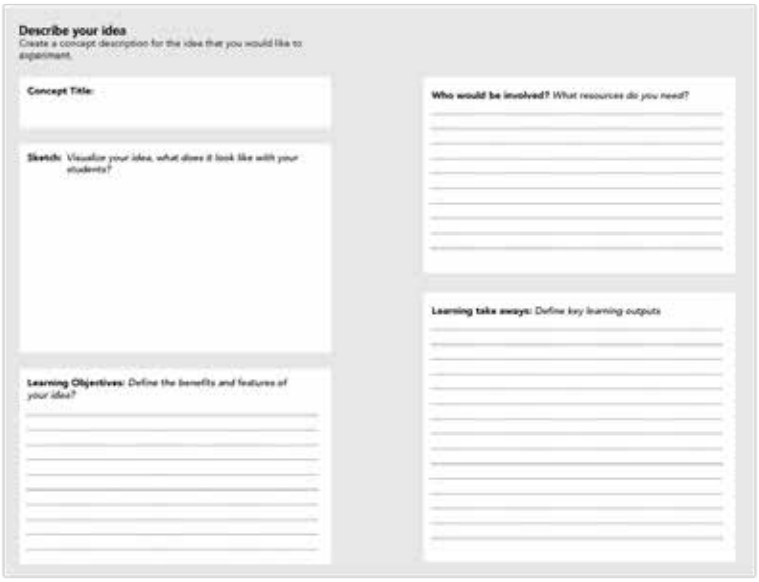
As a teacher you may already have a lesson plan for the school year, whether that is math, science, arts or literature. Consider how might you be able to connect your teachings with the Tower Garden at different stages of the program **(Refer to GFM Stages in page 8).**

Similarly, as a community educator you may already have program areas that could align with the Tower Garden and that can be incorporated in your teachings. This could range from health, recreation and sports or culinary-based perspectives. In both cases, we recommend creating a template that can help you chart the course of your teachings. You can either make specific lesson plans or make daily activities. This includes making growing and/or cooking habits such as weekly or bi-weekly journals about the tower's process or planning in advance to sell your produce in your school or community setting.

One way to take your ideas into actionable items is to describe them in layman terms. Describing your activity in detail will help you find challenges, opportunities, learning aspirations and supports needed.

Here is an **Idea Template** to get you started.

- Choose a title for your idea
- Make a quick sketch to visualize your process
- Describe Learning Objectives
- Who else would be involved?
- Explain learning takeaways for students/participants.



Check out our printable worksheet in the Toolkit section for more information.

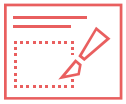
4. Experimenting with your Existing or New Lesson Plans

Are you coming up with new lesson plans or activities? How do you know if they are working?

If you are trying something new with students/participants, you can always experiment to bring your ideas to life. A simple way is to use our handy Lesson Plan Template to craft your new idea and get your students/participants to engage with new content. It will provide you with direct responses where you can learn, improve and refine your activities throughout the program.

To start, we recommend creating a pilot run or prototype. This will provide you with a direct and rapid response from student/participant's experience. Moreover, it will allow you to assess your the strengths and needs of your lesson activities.

Here are a few ways that you can experiment your new ideas with your Good Food Machine:



Create a mock up: Build mock-ups of your lesson plan with simple sketches on a piece of paper. Make it as simple and direct as possible and have others to interact in a short and concise manner.

A good example is if you are hoping to describe how a hydroponic Tower Garden works and would like to showcase the different technical elements, you may do this by sketching separately and have students/participants to put the pieces together.

Create a model: Put together three-dimensional representations of your lesson plan. Use what you have in school such as paper, cardboard, pipe cleaners, fabric and whatever else you can find.

A good example is if you are hoping to describe how the food system works, you may do this by creating a map of producers, distributors, consumers and waste collectors in a three-dimensional manner. Legos are amazing to humanize your lesson plan!

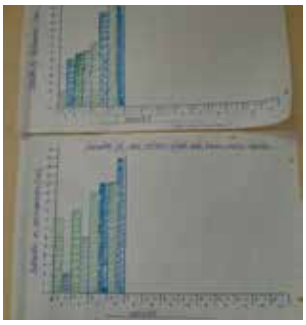
Create a role play: Act out the experience of your lesson plan. Try on the roles of the people or systems that are part of the situation and uncover questions students/participants might ask.

A good example is if you are hoping engage students/participants in understanding the implications of genetically-modified-organism (GMOs), you can create a role play activity that includes the roles of the gene, the organism, the producer, the nearby foods and the health implications.

6. Some Case Studies of our Good Food Machine Lesson Plans

Here are a few examples of specific workshops with curriculum links that have been successful with our Good Food Machine program.

Grade 1
Math: Patterning and Algebra



Learning Activities

- Have students make recurring patterns with the leaves, or match up leaves based on size, colour, texture, etc.
- Students track plant's growth over the course of GFM program.

Grade 4
Healthy Living: Signature Salads

Learning Activities

- Students demonstrate an understanding of factors that contribute to healthy development.
- Students identify the key nutrients provided by foods and beverages, and describe their importance for growth, health, learning and physical performance.

Grade 10
Business: Creating Media Text

Learning Activities

- Create a variety of media texts for different purposes and audiences, using appropriate forms, conventions, and techniques.
- Students gain confidence skills by presenting their work.

Grade 12+
Cultural Studies: What Toronto Eats

Learning Activities

- Have students learn about foods from different cultures and discuss their own home growing experiences
- Analyze how cultural identities are socially constructed, preserved, transmitted, and transformed.

Other Successful Lesson Plans

Basic Fridge Pickles
Young Grades

Rice Paper Rolls
All Ages

Stone Soup
All Ages

Remember: If you are working with younger children, we recommend having visual cue cards or posters that helps them define a good over a bad experience.

If you are working with older students or adults, formulate questions that encourage students/participants to build on your idea. Questions might include:

- *Can you describe what excited you the most about the lesson plan? Why?*
- *If you could change one thing about this activity, what would it be?*

If you would like to see all of the educational lesson plans, please visit the webiste at www.foodshare.net/educator for more information.

4.

ANIMATE YOUR TOWER GARDEN

DIFFERENT WAYS TO ANIMATE YOUR TOWER GARDEN

1. Sell Your Produce

One good way to animate your tower is to sell your produce! Invite family, friends and colleagues to purchase produce or donate. If you are a teacher, you can use this as a way to raise funds for a school program, specific items or goal for your classroom. If you work at a community centre you can get members involved by volunteering their time to prepare a meal and sell it to other members.

How do you start? There are a couple of ways to determine what and how to promote or sell your tower greens. Here are a few tips for you to consider:

1. Make sure staff, teachers and parents understand your expectations. For instance, if your goal is to sell your produce to raise funds, make it as clear as possible. Use posters or create invitations to get the word out.
2. Determine prices based on accessible and affordable foods. Take a look at your neighbourhood and compare prices with nearby supermarkets. A good way to walk to your local grocery store or bring in flyers and engage in conversations around market prices and how it may or may not benefit families.
3. Get students and/or community participants to take part in your communications, promotion, selling and distribution of foods. Make sure they feel included at various stages and that their experience is reflected with the people they will be interacting with.

If you'd like to get more information check out our step-by-step guide in our Toolkit section.

2. Share recipes with parents, teachers and community members

Create a tower-based recipe book to share with parents, teachers and community members. Through our work with the Tower Garden we have seen parents taking the time to cook a meal of their own and share with students and staff. Inviting parents to share their food recipes and memories is a great way for storytelling between mixed ages.

You may also invite other teachers and staff to come up with new recipes. For example you can host a staff recipe competition in your school or community space. Get staff to use the Tower Garden greens as "secret ingredients" and have other foods available if needed. The goal is to share food knowledge between students/participants, family members and staff and provide a fun and inviting space for all.

Alternatively, you can also use and/or modify our recipes in our FoodShare website at foodshare.net/educators

3. Broadening Your Tower's Outreach

As a teacher you might want to connect with staff about showcasing your Tower Garden at a school assembly. As a community member you might want to connect with other staff at a weekly meeting or public events.

In both cases, get your participants involved in speaking about the Tower Garden and their experience with others. It will help you foster healthier relationships with your school or community. If you are looking for specific resources (i.e., funding, support, donations, etc) make a list of individuals who may be able to support you and invite them to check out the project in your school or community setting.

There are a couple of ways to make these connections happen:

1. Determine a meeting place and time frame to invite different stakeholders (i.e., teachers, staff, parents, local councillor, organization representatives etc). Make sure to specify your main goal for the meeting and why you think it's important.
2. Choose a couple of your students/ participants to speak about the Tower Garden experience. It will provide a more empathetic approach to those who are not aware of the project.
3. Invite stakeholders to experience the tower themselves. Create an activity that engages them to pick, taste and share with others. We recommend using one of our Signature Salad Lesson Plans as an introduction to the tower.
4. Define key learnings or take aways for each of the stakeholders. For instance you may just want parents to become aware of healthy foods at home, while you may want a local councillor to provide supports at the municipal level.

4. Using Your Tower for Special Events

There are always a whole slew of events throughout the school or program year that includes food one way or another. You can find ways to utilize the Tower Garden at special events such as staff meetings, lunch events, school assemblies, dinner gatherings and more.

Have the Tower Garden on display to ensure they know that what they are eating is coming directly from the tower.

If you are hoping to use the Tower Garden at a community event, make sure you have all the items required including permits, space, safety checklists, accessibility needs and more. We recommend contacting the person in charge and get all the information you need before jumping right in.

Case study
HEYDON PARK | Toronto

Launch Event showcasing new outdoor gardens constructed behind the school. With the participation of Foodshare, teachers were able to showcase the Tower Gardens nearby food stations. This increased attention to the GFM program inside and outside of the school.

Remember: Make sure you always have information to distribute or to show. We have found that info boards showing participant's work helps people get connected and inspired about the Tower Garden. Students have the opportunity to speak about their work and helps them increase their public speaking skills.


Water
fountain

5.

KITCHEN CART

This section only applies for schools who have purchased Kitchen Carts as part of their Good Food Machine package.

WELCOME TO YOUR KITCHEN CART

1. Introduction to the Kitchen Cart

Before we begin, let's go over some ground rules to get you started. (This in consultation with TDSB's Health and Safety Department):

1. No student should be pushing the cart, ever.
2. No carrying up and down stairs. Once it's up, it's up. If you need it taken up, contact the TDSB's Task Force for help.
3. Check the weight capacity of your elevator, the DRY weight of the cart alone is 275 pounds (125kg).
4. When your cart is being moved, ensure it's in it's proper "mobile state" with latches closed and things securely stored in drawers.
5. Make sure your caretaker is involved and aware of the extra programming that will be happening with the cart. They need to know about the extra sanitizing and waste management that will be going on.
6. **NOTE: It is never the caretaker's responsibility to clean and maintain your cart. It's yours.**
7. All carts need a First Aid Kit to accompany them.
8. Cart servicing can be arranged through the suppliers. More on this later.
9. Even though the cart will be used for water-based cooking mostly (e.g. no grilling etc.), excess steam may trigger the fire alarm - be warned.

Using this Document

Print page/s for display with or near your kitchen cart. If you have access to a laminator, even better! If laminated, update forms or checklists with white board (non-permanent) markers. Print as many of these as you need.

How to use your kitchen cart?

Designed specifically for use in schools, teachers and FoodShare staff alike will be able to wheel the mobile kitchen cart to the preferred workshop location (classroom, library, gym, foyer, outdoor space…) to make simple cooking and tasting activities easily accessible for students.

- The cart has a hand washing station built-in for students to use, saving valuable time during workshops.
- The cart folds out to include prep surfaces that are adaptable to different heights to suit different grades.

- The kitchen cart can be plugged into regular electrical outlets to be operated and provides 3 additional countertop charging stations for additional tools such as blenders.
- Each school has been supplied with a basic kitchen utensil kit valued at $200 to further animate their kitchen cart and improve it's usability.

2. Induction vs Non-Induction Stovetops

Induction	Non-Induction
Quick Temperature Adjustment: The cooking heat increases and decreases extremely fast and with great accuracy. No longer do you have to wait forever for water to boil. In fact it cuts down your cooking time immensely!	**Variable Temperatures:** Traditional stovetops will take longer to cook or boil food. However, it is still perfectly fined, just make sure you have a little bit more time.
Safety: Your induction stove top remains cool so you can't be burned when you touch it. This is especially important for young children and for you in the kitchen.	**Safety:** Make sure you have full attention when working with traditional stovetops, in particular working with children. Make sure to keep little hands out of reach.
Zero Heat Loss: Since induction transfers heat directly through it's electromagnetic field, your induction pans will absorb all the energy directly. Any surface that is not in contact with the induction stove top will not be transferred.	**Heat Loss:** Traditional stovetops will tend to loose heat while cooking, thus taking longer than usual.
Health: Since the induction stove tops only use electro magnetic energy, they do not burn gas that could harm your health.	**Health:** As some traditional stovetops do not produce fumes, it is important to keep food away as it may burn easily and trigger fire alarms.

3. What To, or Not To Cook on Your Kitchen Cart:

Simple, quick and healthy dishes will suit the mobile kitchen cart well. Ideally, students will be harvesting greens or herbs from their Tower Gardens and using them to prepare simple dishes in class such as:

- Salads and salad dressings
- Pesto and other dips
- Soups
- Sandwiches and wraps
- Smoothies and smoothie bowls
- Stir fries and fried rice.

The following cooking techniques are not appropriate or possible with the mobile kitchen cart:

- Deep frying
- Baking or broiling
- Grilling or barbecuing

4. Kitchen Cart Workshop Safety:

Each school is required to supply a First Aid Kit that will stay with the cart. It is the responsibility of the school to ensure the kit is up to date with supplies.

Note: FoodShare's GFM Educators have their up-to-date **Food Handler Certificate** and **First Aid Certification**. It is up to each school to find out and record who, on staff, have the same.

Cart Maintenance

For general maintenance concerns, the suppliers at Stephenson Custom Case can be contacted. Contact for warranty issues, faulty or damaged parts, servicing at **john@stephensoncase.com** or **+1.905.542.8762**

Kitchen Cart Booking

If you would like to bring the Kitchen Cart to your school or community centre, we welcome you to get in touch with the Good Food Machine team at: goodfoodmachine@foodshare.net

Visit our Kitchen Cart & Healthy Safety sheet in the Toolkit Section for more information.

5. Cleaning Instructions and Information:

If you use the cart, then you will be responsible for cleaning it and all used utensils after each workshop. Here are some recommendations and documents from Toronto Public Health.

General Food Safety Tips and Hints:

- □ **TPH's "Keep Food Safe at Home"**, Available at www1.toronto.ca
- □ Restraining the hair, a ponytail, hat or scarf will do.
- □ Wearing aprons, your school was provided with Good Food Machine aprons, please use them!

Hand Washing

- Hand washing poster (8x11 - found in Toolkit), can be posted with the Kitchen Cart
- Where to wash: From a food safety perspective, it makes the most sense to dedicate the kitchen cart's foot pump sink to hand washing and to wash produce elsewhere. However each school has to fgure out the best solution based on the available facilities.

Sanitizing

- How-to Mix Bleach (Chlorine) for Sanitizing sheet (attached page #), contains information about using bleach. Use of bleach-based sanitizers are allowed in food preparation areas only.
- Consult with your school's caretaker, cafeteria staff, Student Nutrition Program staff and/or Toronto Public Health Inspector about the best sanitizer for your school.
- Please request a copy of Chris Broadbent's letter (TDSB's Manager of Health and Safety) from FoodShare for further clarification on using bleach at your school if needed.

Dish Washing:

- The 2- and 3-sink cleaning method (8x11 - attached page #), choose the best one for your school.
- The 2-sink method is fine for cleaning and sanitizing pots, pans and preparation utensils.
- Reusable cups and cutlery should be washed using a 3-sink method or a dishwasher sometimes the staff room or cafeteria will have this.
- Otherwise, disposable cutlery is the safest option - which of course is problematic from an environmental perspective and best avoided if at all possible.
- See TPH's Food Safety Equipment Requirements chart describing what the regulation says, available: https://www1.toronto.ca

Visit our Clearning Checklist sheet in the Toolkit Section for more information.

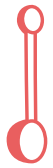
6. How to Mix Bleach (Chlorine) Solution for Sanitizing Your Food Preparation Area

What will you need when making the bleach sanitizing solution:

1x
Litre
Container

1x
Household
Bleach

1x
Spray Bottle
Sanitizer



1x
Teaspoon

1x
Protective
Equipment

Sanitizing	How To Mix	Solution Strength
Utensils: (Food contact areas, e.g. cutting boards, tongs, knives)	Measure 1 litre (4 cups) of water. Add 2.5ml or 1/2 teaspoon of household bleach to the water. Mix well and test solution.	100 ppm chlorine solution
Equipment: (Non-food contact areas, e.g., chairs, tables, fridge, stove, bins)	Measure 1 litre (4 cups) of water. Add 5ml or 1 teaspoon of household bleach to the water. Mix well and test solution.	200 ppm Chlorine Solution

Tips to remember:

- ☐ Mix Bleach with water only. Never mix bleach with other cleaning product.
- ☐ Make fresh sanitizing solution when you start each day and replace every 3 hours.
- ☐ Use chlorine test strips to check the strength of the solution.

Remember: Seek out your school's public health nurse for support and ideas to run a safe classroom.

6.

RESOURCES

RESOURCES FOR EDUCATORS

The resources below have been compiled for teachers and educators working with the Tower Garden in schools or community centres.

Tower Garden Resources

- FoodShare How-to-guides: https://foodshare.net/resources/printable/
- Food Literacy Resources: https://foodshare.net/program/educator/
- Green Bronx Machine in New York, started by a passionate teacher, Stephen Ritz https://foodshare.net/2016/05/25/the-good-food-machine-gets-growing-in-canadian-classrooms/
- For more information about GFM program you can visit http://foodshare.net/program/goodfoodmachine/. Scroll to the bottom to access the Tower Garden and Kitchen toolkits.
- GFM Promotional Video: https://www.youtube.com/watch?v=vFLmxvG5THI
- A copy of the GFM school/program timeline can be accessed at goo.gl/bAjj5d
- Tower Garden set-up guide and instructional tower garden youtube videos: goo.gl/8FvkAu
- For replenishing supplies beyond the first year, check out http://www.towergarden.ca/shop or find a local hydroponic/grow light store.
- Adapt and use our site checklist as a planning guide: https://docs.google.com/document/d/11mCKSt-WIKi6KAI3jbFLdLa3az1lhdBt1yfE3qiIDrQ/edit

School Funding Resources

The following organizations accept applications year-round, or on a rolling basis. For further details and deadlines, please click on the links below.

- TD Friends of the Environment FoundationSchoolyard greening projects are eligible, most projects receive between $2,000-$8,000. Available annually.
- Whole Kids Foundation - Canadian School Garden Grant $2,000 to support an edible garden at a school Available annually (Next round - Fall 2018)
- Metro Green Apple Grant: Funding for projects that support students in adopting healthy eating habits and increasing their fruit and veggie consumption Available annually (Next round - December 2018)
- Evergreen National Environmental Funding Opportunities National Level: https://www.evergreen.ca/downloads/pdfs/2018/National_Environmental_Funding_Opportunities_2018.pdf

THE GOOD FOOD MACHINE

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