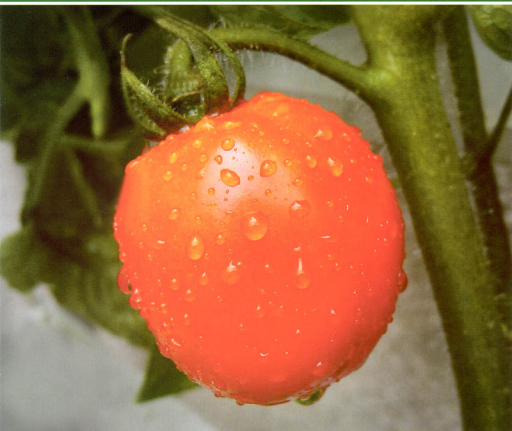


Harvesting Singapore's Concrete Jungle

With
Hydroponics



Grow tomatoes and other vegetables in your HDB flat

Your Future

Growing Vegetables In Your HDB Flat

Do you want fresh vegetables from your own balcony for salad? Grow tomatoes, long beans, roses and herbs in your flat. You can even grow them in your bedroom or office by using fluorescent tubes.

What Is Hydroponics

Hydroponics is a term used to describe growing plants without soil. In hydroponics cultivation, water mixed with specially prepared nutrients is brought by a pump to the roots of the plants.

You can use hydroponics to grow almost anything. From vegetables, fruits, flowers, to herbs. You can do it outdoors, indoors, on rooftops, balconies, and even next to your window sill.

Hydroponics cultivation is used on a commercial scale all over the world. It is simple, cost effective, environment friendly and efficient. And the greens are cleaner and taste better.

Now, you can do it all by yourself in the comfort of your HDB apartment or in your garden. In fact anywhere. You just need an area of one square meter. Your HDB balcony is ideal.

It is easy. Fun. Cheap. Rewarding. Satisfying. You will be eating what you sow and the therapeutic benefit of this is to see the greens growing leaf by leaf, day by day, before your eyes. You get your first harvest in about five weeks. You can use your aquarium accessories for the set-up.

Hydroponics For Beginners

For hobbyists, the easiest way is to use the NUTRIENT FILM TECHNIQUE (NFT). Your hobby hydroponics set uses this system.

In this method, the plants are grown in channels in which scientifically formulated nutrients are constantly brought by an aquarium pump to the roots.

The hobby hydroponics set from Fresh Garden Hydroponics Centre makes home farming very easy. It comes complete with easy-to-install instructions, nutrients, a pump, pots and seeds for you to get started. You get your first crop in about five weeks.



ure HDB Estate

Getting Started

How To Assemble The Hobby Set

Find a place where there is sunlight. You require at least six hours of sunshine daily. If sunshine is not available, artificial lighting can be used.

The hobby hydroponics set comes in two boxes: a bigger box containing the aluminium stands and channels and a smaller box containing a black rectangular tank with two bottles of nutrients, 16 black pots, seeds, and an aquarium pump with hose attachment.



Three weeks old butterhead lettuce

Installation Instructions

Your hobby hydroponics set comes complete with everything you need to get started. The set comes in two boxes: a big box and a small box.

- 1 Open the bigger box and you will find several pieces of aluminium stands with rubber attachments at the ends. Join the ends together and you will form a rectangle table. Make sure that one side of the table is higher than the other.
- 2 In the same box you will find four channels (white on the outside and black on the inside). Clip them on to the stand. There will be a trough. Join the trough to the four channels. Make sure that it is at the lower side of the aluminium tables. This trough will collect all the returning water and lead it into the black container to be recycled.
- 3 In this box you will find a PVC pipe with connecting black micro tubes. Insert the micro tubes into the holes in the four channels.
- 4 Once this is done, connect the PVC pipe (the one with the micro tubes) to another PVC pipe using the T-join. This second PVC pipe comes already secured to the underside of the aluminium stand. Use the elbow to connect this pipe to the water pump via the hose attachment. Fill the container with nutrients and you can now switch on the pump. The stop cock is for you to control the amount of nutrients reaching the roots. The rate should be 2-3 liters per minute per channel.



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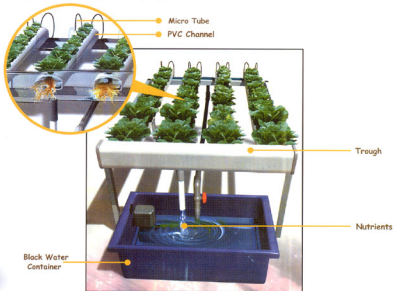
The Hobby Hydroponics Set

Inside The Magic Box

Box No. 2 contains a black water container. This is the reservoir tank for the nutrients. The waterproof pump is to be placed inside this container. Attach the pump to an electrical socket. When you switch it on, the pump will send the water along the PVC pipe and force it through the black micro tubes into the channels before plunging down to the black reservoir tank.

The hobby unit is designed to be used under all weather conditions. You do not need to worry about rust. The stands are made of aluminium and the channels made of UV stabilised rigid PVC. The pump is waterproof. It should always be used inside water.

Other items in the Hobby Hydroponics set include: seeds, nutrients, pots and an aquarium pump.



e This

With Hydroponics

Q and A

Questions & Answers on Hobby Hydroponics

Q What is Hydroponics?

A It is the cultivation of vegetables and plants without the need for soil.

Q What can I grow with Hydroponics?

A Almost anything - from your favourite vegetables to your favourite garden plants. For example: lettuce, long beans, cucumber, tomato, roses etc.

Q Where can I grow these plants and vegetables?

A Almost anywhere. Using the Hobby Hydroponics set, all you need is a space of about one metre by one metre. Your HDB (Housing Development Board) balcony is ideal for such a set-up. Of course if you have a garden you can use it and even customize the size to fit your favourite viewing area.

Q Can I grow them indoors?

A Yes, with artificial sunlight bulbs or fluorescent tubes easily available from aquarium shops. All plants require sunlight to make plant food. If you grow them in your balcony or next to your window sill, there will be sufficient natural sunlight to stimulate the growth.

Q What is the cost?

A Very affordable. The running cost is low and it is almost maintenance-free. The Hobby Hydroponics set comes complete with nutrients, seeds, and an aquarium pump.

Q Can I eat the vegetables?

A Definitely. The vegetables from your hydroponics harvest taste better and are free from pesticides.

Q How long can I go on using the Hobby Hydroponics set?

A Indefinitely, so long as you have the nutrients. When one crop is harvested, you can immediately put in new seedlings and watch them grow again. You can even stagger your yield by putting in seedlings of various ages and enjoy continuous self-grown vegetables from the comfort of your home.

Q Is it easy to use the Hobby Hydroponics set?

A Very easy. All you need is to set up the knocked-down set and this can be done in 10 minutes. It is made of aluminium and UV stabilised PVC meant for outdoor use.

Q Where can I get the seeds for the plants?

A The set comes with seeds. If you need more and want different varieties, you can buy them from supermarkets. One packet of seeds (about \$1.50 cents) can last you for many, many crops.

Q Can I shift the set to another place?

A Yes - almost immediately. All you have to do is to remove the pump, and you can carry it anywhere. It is very light.

Q Will it breed mosquitoes?

A NO.

Q If I need technical help, where can I get them?

A The internet, hydroponics books or email: pethouse@cyberway.com.sg



Preparing nutrients for SEEDLINGS

How To Germinate The Seeds

The hobby hydroponics set comes complete with an aquarium pump, nutrients, seeds, pots and growing media (perlite and vermiculite). Fill the black pots up to 3/4 full with the perlite and vermiculite. Find a tray in which you can put in about 1 cm of tap water.

Put the pots into the tray

- 1 Wet the pots. Put one seed into each pot (you can even put two seeds in each pot but you must later remove the weaker seedling) and cover it to the brim with more growing media. Water it again. Continue to water for at least 48 hours. Keep them in the dark by covering with newspaper or black trash bag. After you see two leaves coming out of the seed, remove the newspaper or black trash bag and put them in a shaded area. Continue to spray tap water.
- 2 After the third leaf appears, it will be time to drain away the tap water and substitute it with hydroponics nutrient which is prepared in this way.



STEP 1

Put in 1 ml (or cc) of Nutrient A and 1 ml (or cc) of Nutrient B for every one liter of water. This nutrient solution is meant for the seedlings after it has germinated. Germination takes place in about 48 hours after you have put in the seeds. Some seeds take longer to germinate.



STEP 2

After the seeds have germinated and a third leaf appears, replace the tap water with this solution meant for seedlings. Change the solution once a week. When the seedlings are about 2 weeks old, take the seedlings and put each pot into the holes in the channels.



STEP 3

The ideal pH for this seedling nutrient solution should be between pH 5.8 - pH 6.5. If it is out of this range, you can lower it by adding phosphoric acid or raise it by adding potassium hydroxide, both easily available from aquarium shops. They are called pH up or pH down or minus.

Preparing nutrients for GROWING PLANTS

- 1 The second part of the nutrient solution is prepared in this way:
Fill the black rectangular tank with about 40 liters of tap water (2/3rd full).
- 2 Put in 2 ml (or cc) of Nutrient A and another 2 ml (or cc) of Nutrient B for every 1 liter of water. This means that for the 40 liters of water in the rectangular tank you need to put in 80 ml (or cc) of Nutrient A and 80 ml (or cc) of Nutrient B. Note that in the preparation of the nutrients for the seedlings, you used only half the amount of solution A and solution B (1 cc per liter as against 2 cc per liter).
- 3 If you have an electrical conductivity meter, you can use it. Each type of plants requires a different electrical conductivity value. The mixture (see No.2) will give you an EC reading of 1.2. This is the average requirement for most common fruits and vegetables. For example, the best range for lettuce is between 0.6 and 1.6 milliSiemen per centimeter (mS/cm). If the reading is higher, you can adjust it by adding more water to dilute the concentration. If it is lower, you add more nutrients (equal amount of Nutrient A and Nutrient B). If you do not have an electrical conductivity meter, you can still do it by changing all the nutrient solution every two weeks.
- 4 Switch on the water pump, sit back and watch your fruits and vegetables grow.

Additional Accessories (not included in the set)

If you want optimum growth for your plants and vegetables, there are two things you need to control:

- 1 pH**...this is the acid alkaline condition of the water. Correct pH between pH 5.8 - 6.5 is essential for ideal plant growth. This can be checked by using a pH test kit available from aquarium shops. Cost is below \$10. You can also do this by using a digital pH test pen. Just dip the pen into the solution and get the reading from the digital display. You can use it again and again. Cost: \$65 - \$120



▲ EC Meter & pH Test Kit

- 2 Electrical Conductivity (EC)**...this measures the concentration of nutrients in the holding tank. Hydroponics is dependent on the right amount of nutrient available to the roots. With an EC meter, you will know whether there is sufficient nutrients. The EC meter is a hand held instrument with two electrodes at one end. When this is dipped into the solution, an electrical current passes from one electrode to the other and a reading appears on the digital display. PURE WATER DOES NOT CONDUCT ELECTRICITY. When you add in the hydroponics nutrients, a reading appears because electricity is now being conducted from one electrode to the other. The more nutrient there is, the higher the reading. If you want a higher EC reading, just add in more nutrients. To reduce the EC reading, dilute with tap water.

If you do not have an Electrical Conductivity (EC) meter you can still do it by changing all the nutrients in the black container every two weeks.



The nutrients for your hydroponics set-up come in two bottles marked A and B. They are part of the hobby set. You can buy more of the nutrients from your dealer. Size of the nutrients available is from 1 liter to 5 liters.

Bringing The Greenery Into Your Home



Five weeks old butterhead lettuce. Ready for harvest.

Happy Gardening

If you are tired of keeping aquarium fish, do not throw away your accessories.
Use them for Hydroponics and you will turn your neighbour green with envy

The **Hobby Hydroponics** set is available from **PETHOUSE SUPPLIES**

For additional information and technical assistance you can contact:

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