

# GARDENING GUIDE BOOK

CREATED BY CHULALONGKORN UNIVERSITY AND  
WORCESTER POLYTECHNIC INSTITUTE STUDENTS



# สารบัญ

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ข้อเสนอแนะสำหรับโรงเรียนบ้านหัวยอื่น

1

**ORGANIC  
GARDENING  
SKILLS**

ทักษะการทำเกษตรอินทรีย์

# BENEFITS OF FRUITS AND VEGETABLES



## POTASSIUM

MAINTAIN HEALTHY  
BLOOD PRESSURE

## FIBER

REDUCE BLOOD  
CHOLESTEROL  
LEVELS



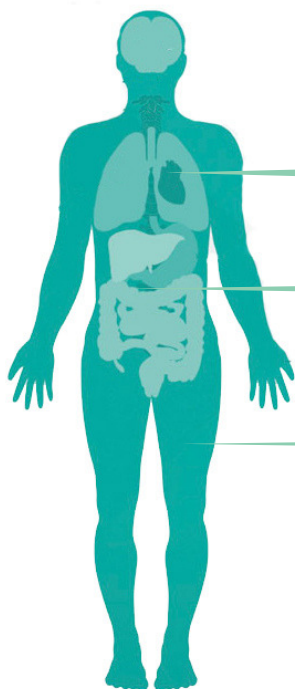
## VITAMIN A

PROTECT AGAINST  
INFECTIONS, KEEP  
EYES HEALTHY

## VITAMIN C

HEAL WOUNDS,  
KEEPS TEETH AND  
GUMS HEALTHY

## HEALTH BENEFITS



REDUCE RISK FOR HEART DISEASE



REDUCE RISK FOR OBESITY  
AND TYPE 2 DIABETES



PROTECT AGAINST CERTAIN  
TYPES OF CANCER





# HOW TO EAT HEALTHY

CARBOHYDRATE

PROTEIN

LIPID



FRUITS

VEGETABLES



DRINK 6-8 GLASSES  
OF WATER A DAY





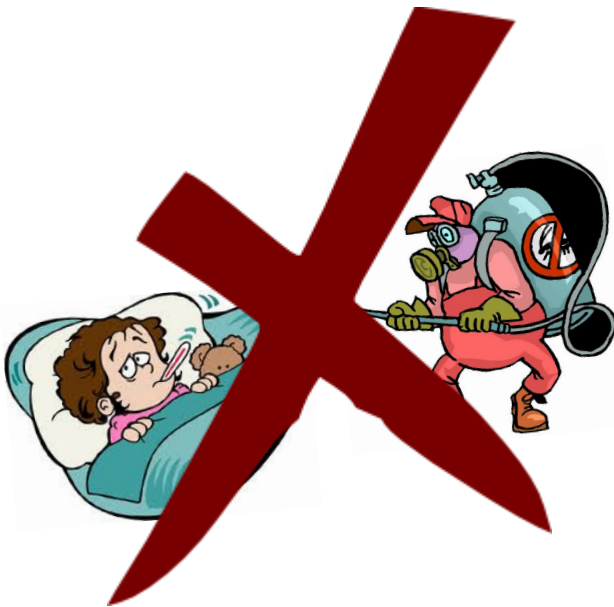
# WHAT IS ORGANIC ?

ORGANIC GARDENING IS A GARDENING TECHNIQUE THAT DOES NOT USE ANY CHEMICALS ON UNCONTAMINATED SOIL WITH UNCONTAMINATED WATER RESOURCE



## WHY ORGANIC?

1. PRODUCT THAT IS NOT CONTAMINATED
2. DOES NOT HARM THE ENVIRONMENT
3. RESTORE NUTRITION IN THE SOIL



## DISADVANTAGES OF CHEMICAL PESTICIDE

1. HARM NERVOUS SYSTEM
2. COULD CAUSE CANCER, STERILE, ETC.
3. PRODUCTS BECOME CONTAMINATED
4. HARM THE ENVIRONMENT





## HOW TO GROW ORGANICALLY



### PREPARE THE SOIL

WEED THEM OUT!



### DIG THE HOLE

DIG A HOLE WITH THE  
DEPTH ACCORDING TO  
EACH TYPE OF PLANT



### PLANTING

2-3 SEEDS/HOLE\*\*



### WATERING EVERYDAY



### ADD FERTILIZER

ADD FERTILISER WEEKLY



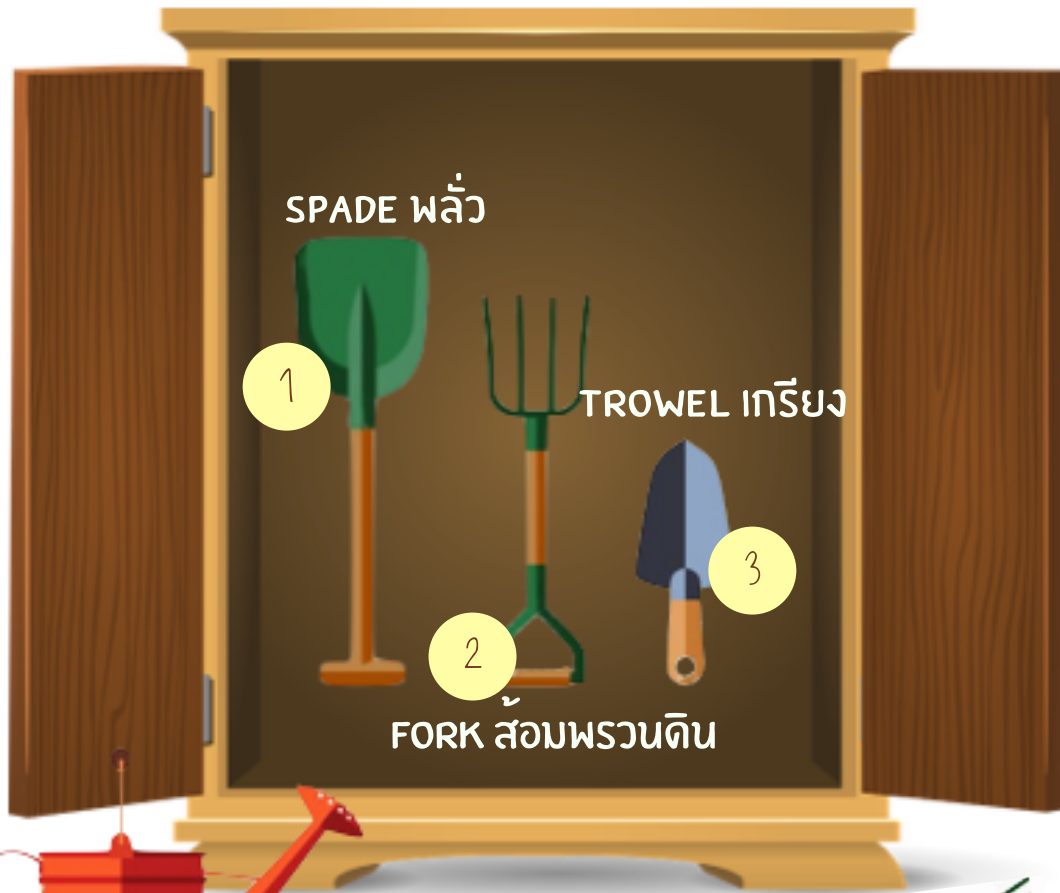
### CHECK FOR PEST



\*\*AFTER GERMINATION,  
PULL THE WEAK STEMS OUT



GARDENING TOOLS  
อุปกรณ์การเกษตร



1 SPADE พลั่ว

2 TROWEL เก็รียง

3 FORK ส้อมพรวนดิน



4 WATERPOT บั้วรดน้ำ



5 RAKE คราด

HOW TO USE EACH TOOL

1. SPADE – DIGGING TOOL
2. FORK – DIGGING TOOL
3. TROWEL – USED FOR BREAKING UP EARTH
4. WATERPOT – WATERING THE PLANTS
5. RAKE – LEAVES AND GRASS COLLECTION TOOLS

# USE OF LAND



## PROS

1. LESS MATERIAL NEEDED
2. MORE SPACE TO PLANT
3. REQUIRES LESS MONEY



## CONS

1. LESS NUTRITIOUS SOIL
2. DIFFICULT TO INCREASE SOIL QUALITY
3. GREATER RISK OF DISEASE

## TIPS

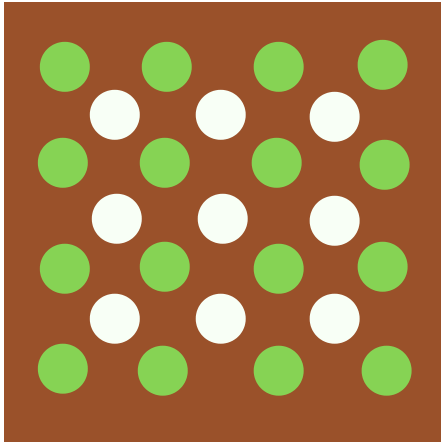
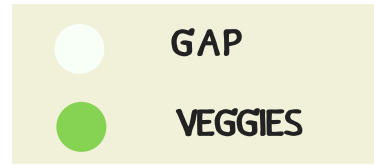
USE RAISED GARDEN BEDS WITH THE FENCES REDUCE THE CHANCE OF INFECTION

AND ALSO REDUCE THE CHANCE OF PEST

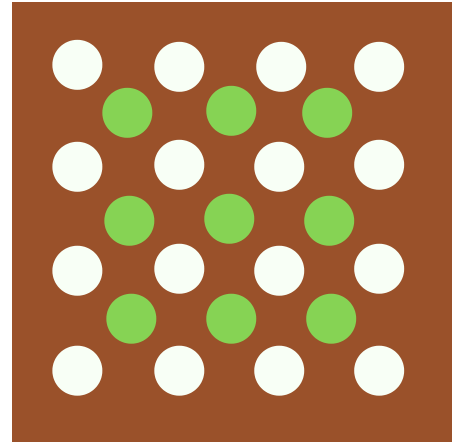


THIS IS PREFERRED OVER ROWS SINCE THE MORE SEPARATED ROWS, THE MORE PATH YOU NEED IN BETWEEN THEM

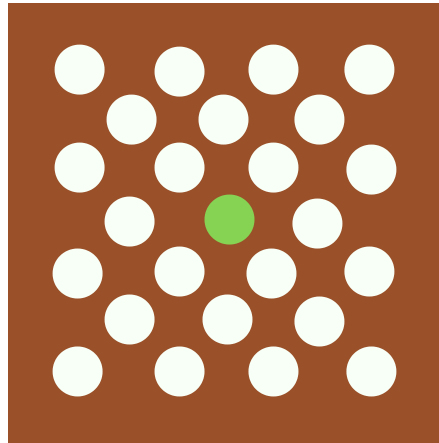
# PROPER SPACE FOR EACH TYPES OF VEGGIES



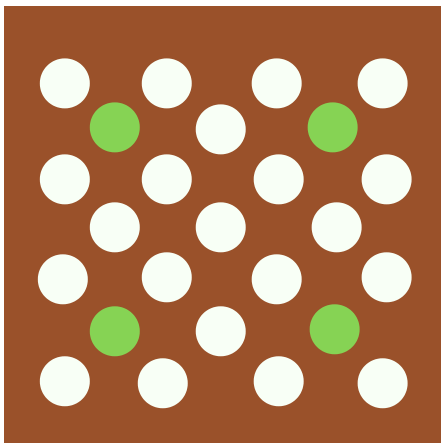
CARROT  
ONION  
MORNING GLORY  
CORIANDER



CHINESE CABBAGE  
HOT CHILLI

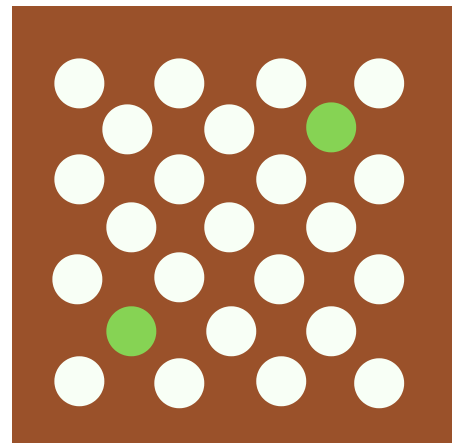


CABBAGE



CELERY  
SPINACH

RED CABBAGE  
STRAWBERRY  
ZUCCHINI  
POTATO



CHINESE KALE  
KALE  
SWEET POTATO  
OKRA  
BROCCOLI



## PROS

1. LESS LIKELY TO GET DISEASES
2. DON'T HAVE TO DIG UP LAND
3. CAN USE THE NEW SOIL
4. GOOD FOR SEEDLINGS
5. LESS WATER

## USE OF POTS



## CONS



1. MORE LIKELY TO OVER OR UNDER WATER
2. NEED TO HAVE DRAINAGE HOLES
3. NEEDS TO BE BIG ENOUGH TO PROVIDE SPACE FOR PLANTS

## TIPS

AS LONG AS THERE IS ENOUGH SPACE ANY PLANT CAN GROW IN A CONTAINER



HERBS DO ESPECIALLY WELL IN CONTAINERS



- OVER OR UNDER WATERING IS THE MAIN WAY OF PLANT FAILURE
- KEEP THE SOIL FROM DRYING OUT AS FAST BY MULCHING WITH STRAW, HAY, COMPOST

# 2

## ORGANIC FERTILIZER AND PESTICIDES

สูตรปุ๋ยอินทรีย์และน้ำหมักไล่แมลง

## INGREDIENTS

BRAN  
HUSK ½ BAG  
A BAG OF COW MANURE  
MICROORGANISMS  
MOLASSES 1 KG  
WATER 20–30 LITERS

# HOW TO MAKE A FERTILIZER



1



MIX COW MANURE WITH RICE SKIN AT THE RATE OF 1:1  
MIX WITH BRAN [¼ TO ½]

2



MIX THEM TOGETHER IN THE SHADE

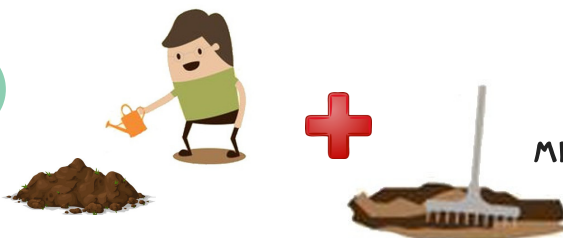


3



PUT MICROORGANISM INTO WATER WITH MOLASSES

4



POUR MIXTURE ONTO THE PILE OF MIXES  
MIX IT WELL AND MAKE SURE EVERY AREA IS JUST WET

5



COVER IT WITH THE BAG FOR 1–2 WEEKS

# HOW TO MAKE A LIQUID FERTILIZER

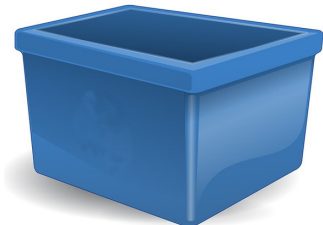


MIX WITH WATER 1:500  
(1 IS FERTILIZER)  
BEFORE USE

## INGREDIENTS

MOLASSES 1 KG  
WATER  
MICRO ORGANISMS  
VERY RIPE FRUITS 3 KG  
\*\*BETTER IF THEY ARE JUICY

1



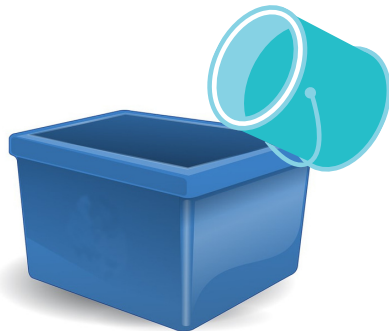
CHOP FRUITS INTO PIECES AND PUT THEM INTO A BUCKET

2



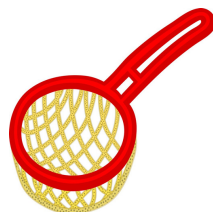
PUT A WATER AND MOLASSES  
INTO ANOTHER BUCKET RATING 1:1  
THEN, ADD MICROORGANISM

3



PURE THE MIXTURE JUST ENOUGH TO COVER THE FRUITS  
AND STIR (ALSO STIR EVERY 3 DAYS)  
THEN, COVER IT WITH A LIT FOR 15 DAYS

4



FILTER TO GET JUST ONLY WATER

## TIPS

THROW THE FRUITS AROUND THE PLANTS \*\*GIVE IT SOME DISTANCE\*\*



# FERTILIZER FROM TREE LEAVES

1. COLLECT DRY LEAVES STACK THEM IN THE CEMENT CYLINDER
2. PUT IN THE LEFTOVER FOOD IN THE MIDDLE OF THE CEMENT CYLINDER



CAUTION: DO NOT LET THE LEFTOVER FOOD TO TOUCH THE EDGE OF THE CYLINDER BECAUSE IT WOULD SMELL BAD.



3. STACK ANOTHER LAYER OF DRY LEAVES INTO THE CYLINDER
4. WATER THE FERTILIZER EVERYDAY FOR 2 MONTHS

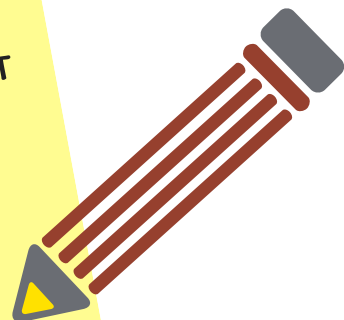


CAUTION: WATER JUST TO GIVE SOME MOISTURE NOT WET



## TIPS

PUT A SMALL CEMENT BLOCK UNDER THE CEMENT CYLINDER TO COLLECT THE FINISHED FERTILIZER UNDER THE CEMENT CYLINDER





# FERMENTED LIQUID: ORGANIC INSECTICIDE



## INGREDIENTS

NIM LEAVES OR NIM SEEDS 1 KG

GALANGAL 1 KG

LEMONGRASS 1 KG

## STEPS

1. CHOP ALL THE INGREDIENTS TO SIZE ABOUT 3.5 CM

2. ADD 20 LITER WATER

3. COVER IT FOR 3 DAYS

4. FILTER AND KEEP ONLY THE WATER PART



## HOW TO USE



MIX 1L OF FERMENTED WATER WITH 10L OF  
WATER

3

# LET'S GROW VEGETABLES

มาปลูกผักกันเถอะ

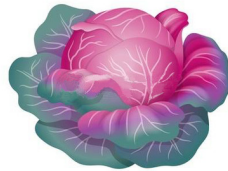
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# VEGETABLES LIST

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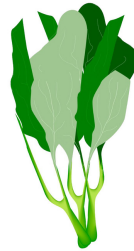
**Cabbage**



**Red  
cabbage**



**Chinese  
cabbage**



**Chinese  
kale**



**Strawberry**



**Morning  
glory**



**Okra**



**Hot chilli**



**Carrot**



**Broccoli**



**Coriander**



**Pumpkin**



**Radish**



**Spinach**



**Celery**



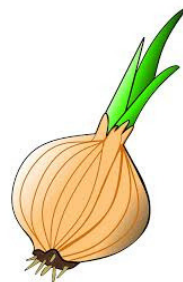
**Kale**



**Sweet  
potato**



**Potato**



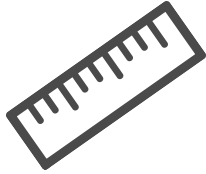
**Onion**



**Zucchini**



**SUITABLE SEASON TO GROW THE PLANT**



**DISTANCE BETWEEN EACH  
PLANT AND SOIL DEPTH**



**FREQUENCY TO WATER THE PLANT**



**REQUIRED AMOUNT OF SUNLIGHT**



**DURATION UNTIL FULLY GROWN  
AND READY TO HARVEST**

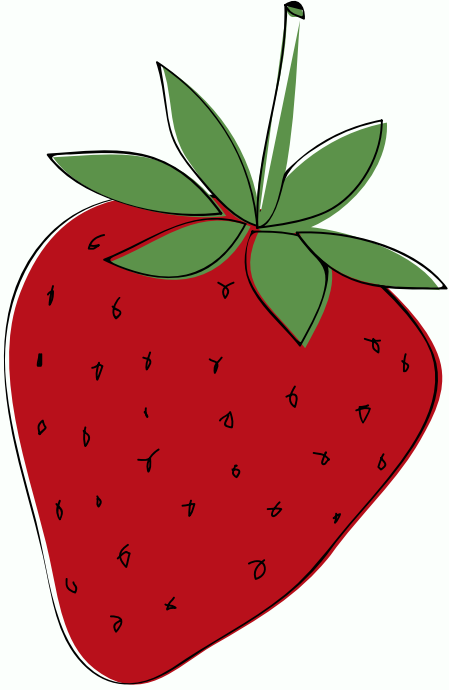


**HEALTH BENEFITS**

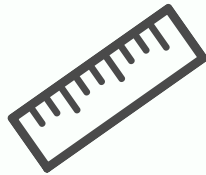


**ADDITIONAL INFORMATION**

# STRAWBERRY



✓ WINTER  
✗ SUMMER



25–30 CM



TWICE A DAY



FULL SUN 6–12 HOURS



3–5 MONTHS



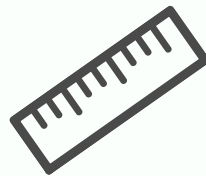
SHOULDN'T GROW ON THE SAME  
GARDEN EVERY YEAR

# CARROT



✓ WINTER

✗ RAINY

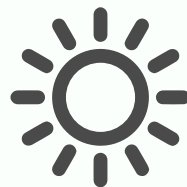


7 CM

SOIL DEPTH 30CM



TWICE A DAY



FULL SUN



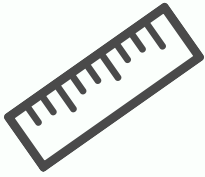
2-3 MONTHS

# MORNING GLORY



WHOLE YEAR

✓ RAINY



15 CM



TWICE A DAY

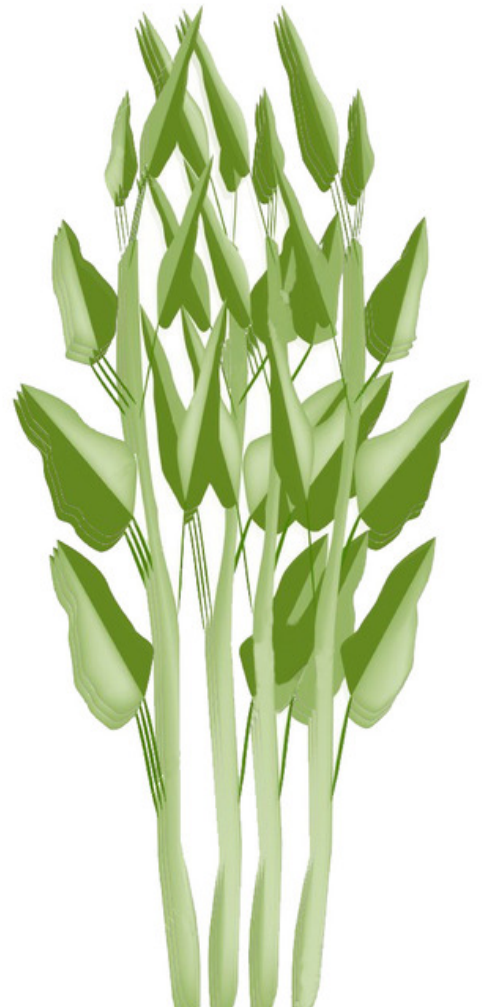
(LIKES WATER)



FULL SUN



1 MONTH

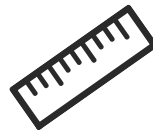




# OKRA



✗ WINTER



50 CM



**DROUGHT PERIOD: EVERYDAY**

**RAINY SEASON: ONCE IN 2-3 DAYS**

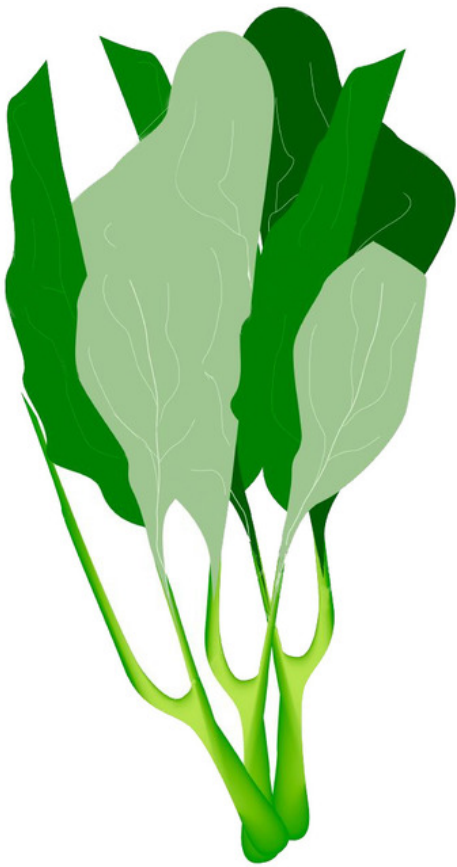


**FULL SUN**

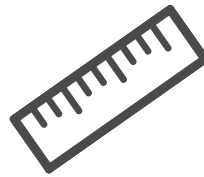


**1.5-2 MONTH**

# CHINESE KALE



WHOLE YEAR  
OCT-APRIL



20 CM



FULL SUN



TWICE A DAY



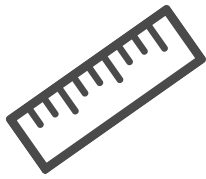
1-2 MONTHS

# HOT CHILI



✓ DROUGHT

✗ WINTER



50 CM



DOESN'T NEED MUCH WATER

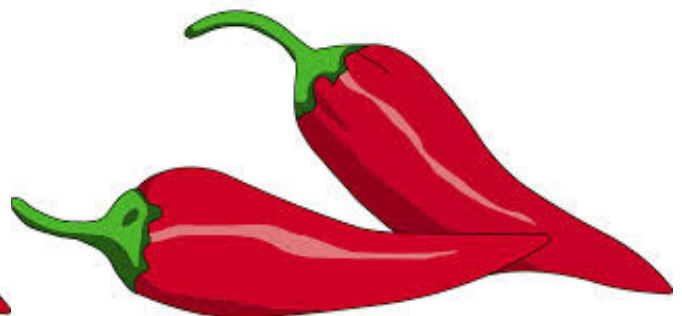
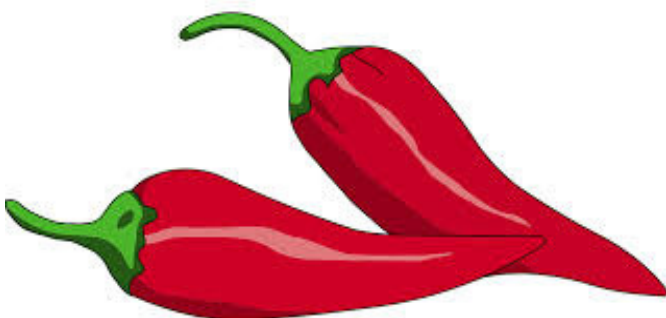
INCREASE WATER AFTER FLOWERING



LIKES SUN



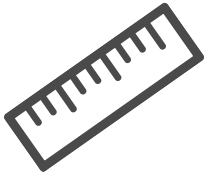
2-3 MONTHS



# CORIANDER



WHOLE YEAR



10–20 CM



TWICE A DAY ( LIKES WATER)



SURVIVE IN SHADES



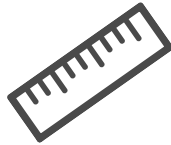
1–1.5 MONTH



# CHINESE CABBAGE



WINTER



40–50 CM



TWICE A DAY

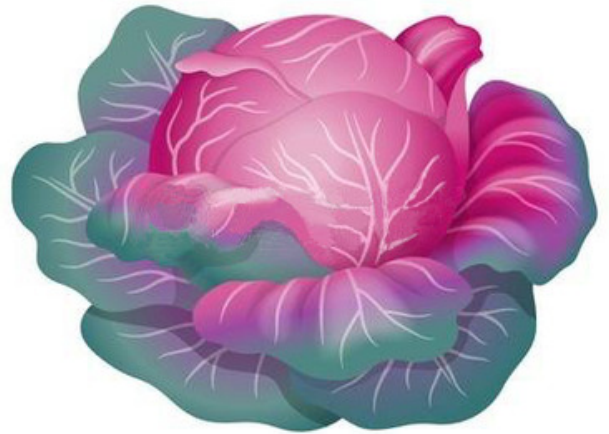


FULL SUN



2–3 MONTHS

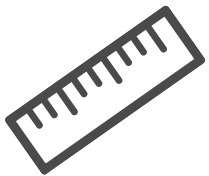
# RED CABBAGE



WINTER



OCT-MARCH



40 CM



TWICE A DAY



CAN SURVIVE IN LITTLE SHADES



2-3 MONTHS

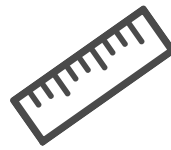
# CABBAGE



WINTER



OCT-MARCH



40 CM



TWICE A DAY



LIKES SUN

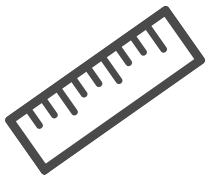


2-3 MONTH

# BROCCOLI



✓ WINTER



50-60 CM



WATER EVERYDAY IN  
THE MORNING AND EVENING



FULL SUNLIGHT



2 MONTH



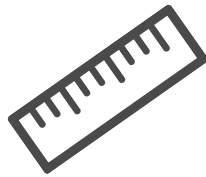


# RADISH



**WINTER**

✓ OCTOBER–JANUARY



**20–30 CM**



**WATER EVERYDAY IN  
THE MORNING AND EVENING**



**FULL SUNLIGHT**



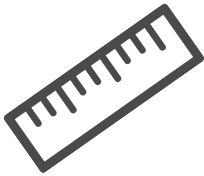
**1.5 MONTH**



# PUMPKIN



WINTER



150 CM

SOIL DEPTH 25–30 CM



WATER EVERYDAY IN THE EVENING

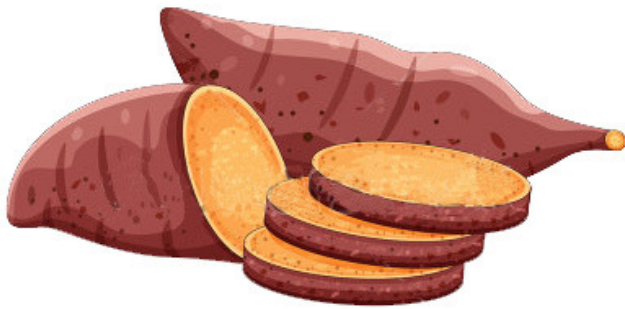


FULL SUNLIGHT



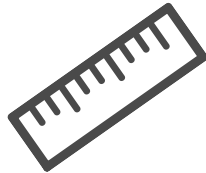
4–6 MONTHS

# SWEET POTATO



✓ SUMMER, DROUGHT

✗ RAINY



30 CM

SOIL DEPTH 25–30 CM



RAINY: DO NOT NEED TO WATER

SUMMER : WATER EVERYDAY



FULL SUN



3–4MONTHS

REDUCE BLOOD PRESURE



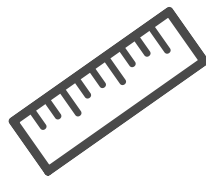
REDUCE BLOOD SUGAR LEVEL

REDUCE CHOLESTEROL

# KALE



WINTER



50 CM



WATER EVERYDAY IN THE  
MORNING AND EVENING



CAN SURVIVE IN LITTLE SHADES



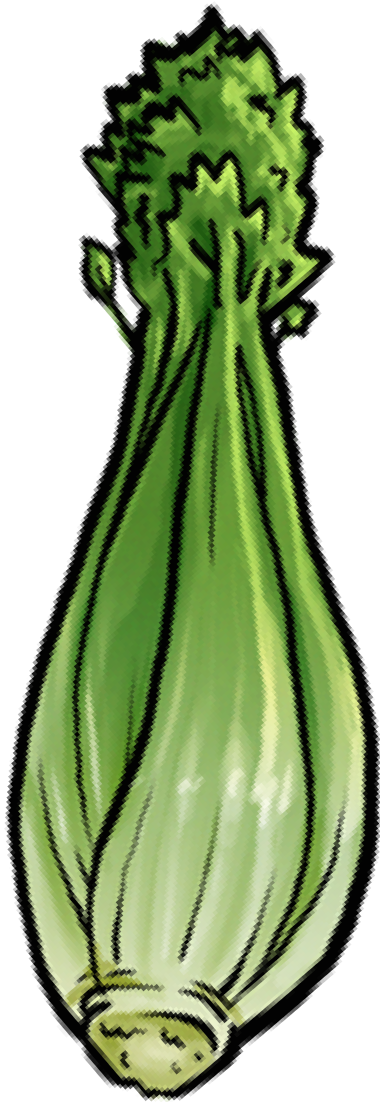
1.5-2 MONTH



REDUCE CHOLESTEROL

REDUCE CHANCE OF CANCER AND CARDIO  
DIEASE

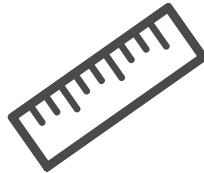
# CELERY



WINTER



SUMMER



15 CM



WATER IN THE MORNING AND  
EVENING



PLANT IN LITTLE  
SHADES



2.5– 3 MONTH



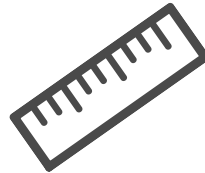
REDUCE ALZHEIMER

REDUCE CARDIO DISEASE

# ONION



WINTER



15 CM



EVERYDAY IN THE MORNING AND EVENING. REDUCE WATER WHEN ONION IN FULLY GROWN



DIRECT SUNLIGHT



2.5-3 MONTH

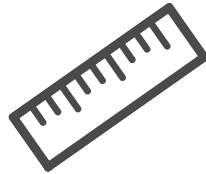


REDUCE BODYFAT  
REDUCE BLOOD PRESURE  
REDUCE ALLEGY

# SPINACH



WINTER



10 CM



WATER EVERYDAY IN THE MORNING  
AND EVENING



FULL SUNLIGHT



1 MONTH



HEALTHY SKIN  
REDUCE WEARY



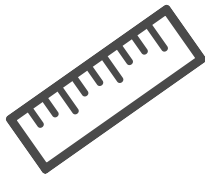
# POTATO



WINTER



SUMMER



15 CM

SOIL DEPTH 15–20 CM



WATER EVERYDAY IN THE MORNING  
AND EVENING



NO DIRECT SUNLIGHT  
PLANT IN LIGHT SHADE



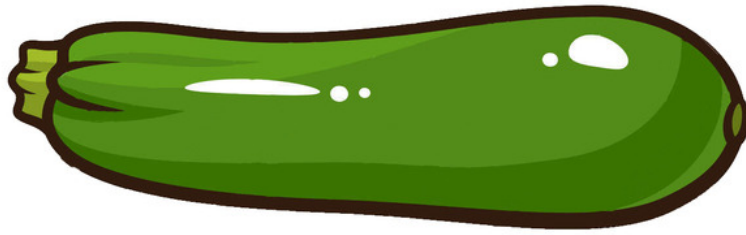
2–3 MONTHS



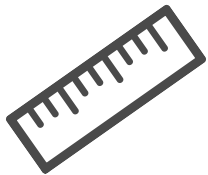
REDUCE CHANCE OF CATCHING COLD



# ZUCCHINI



ALL YEAR ROUND



70–100 CM



WATER EVERYDAY IN  
THE MORNING AND EVENING



SUNLIGHT

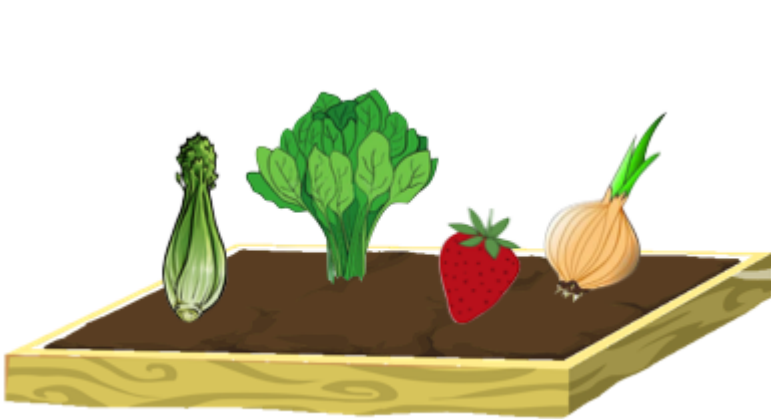


1.5 MONTH



REDUCE CHANCE FOR CARDIO  
DISEASE AND BLOOD SUGAR  
LEVEL

# COMPANION PLANTING



**FUN FACTS**  
CELERY CAN REPEL  
BUGS



**STRAWBERRY SHOULD NOT BE PLANTED WITH CABBAGE**

## WARNING

EACH TYPE OF VEGETABLE  
NEED DIFFERENT AMOUNT  
OF WATER AND SUNLIGHT

BE AWARE OF DISTANCE  
BETWEEN EACH PLANT

**4**

**VEGETABLE  
RECIPES**

สูตรอาหารจากผักชนิดใหม่

# STIR FRIED ZUCCHINI WITH EGG



1 ZUCCHINI

OYSTER SAUCE

2 EGGS

SALT

3 CLOVES OF GARLIC



1

TURN ON THE HEAT, PUT OIL IN THERE AND  
WAIT UNTIL IT BOIL

2

SAUTÉ GARLIC UNTIL ITS GOLDEN BROWN

3

PUT ZUCCHINI IN THERE AND UNTIL IT IS SOFTEN  
DOWN SEASON WITH OYSTER SAUCE AND SALT

4

MAKE A HOLE ON THE MIDDLE OF THE PAN. THEN,  
PUT AN EGG IN THERE LET IT COOK JUST A LITTLE  
BIT AND MIX THEM TOGETHER

# POTATO SOUP WITH CHICKEN



POTATO

CILANTRO

FISH SAUCE

ONION

CHICKEN

BROWN SUGAR

TOMATO

SALT

CUBE SOUP

CARROT

BLACK PEPPER



1

BOIL THE WATER AND PUT SOUP CUBE IN THERE

2

PUT CHICKEN, CILANTRO ROOT, POTATO, BLACK PAPER  
AND CARROT IN THE POT

3

WAIT UNTIL BOIL AND TAKE OUT THE BUBBLE

4

SEASON WITH SALT AND SUGAR, AND THEN PUT  
ONION AND TOMATO IN THERE

5

WAIT UNTIL EVERYTHING IS COOKED

# SPINACH SOFT- BOILED RICE



ONION

COOKED RICE

SALT

GARLIC

CITE SOUP

SPINACH

FISH SAUCE



1

TURN ON THE HEAT WITH A LITTLE BIT OF OIL IN A POT, SAUTE ONION UNTIL THEY ARE GOLDEN BROWN AND THEN, PUT GARLIC IN THERE AND SAUTE UNTIL GOLDEN BROWN

2

PUT WATER INTO THE POT WITH SOUP CUBE

3

PUT SOME COOKED RICE IN THERE, TURN DOWN THE GAS, AND STIR FOR 20 MINUTES

4

PUT SPINACH IN, SEASON AS LIKING AND LET BOIL THE SOUP BOIL FOR 7 MINUTES

# SAUTE SPINACH



SPINACH

GARLIC

SALT

SOY SAUCE

BLACK PEPPER



1

TURN ON THE GAS, MEDIUM HEAT, SAUTE  
GARLIC UNTIL GOLDEN BROWN

2

PUT SPINACH INTO THE PAN

3

STIR FRY UNTIL COOKED

# CELERY WITH PORK STIR FRIED



CELERY

SOY SAUCE

SALT

MARINATED PORK

OYSTER SAUCE



**1**

CHOP CELERY INTO DICES

PUT OIL INTO A PAN WAIT THEM TO GET HEATED

**2**

THEN PUT CELERY INTO SAUTE THEM UNTIL THEY  
ARE COOKED AND PUT IT ON THE PLATE

**3**

PUT MORE OIL INTO THE PAN AND COOK  
MARINATED PORK

**4**

PUT CELERY BACK INTO THE PAN AFTER THE PORK  
IS COOKED SEASON WITH OYSTER SAUCE



# KALE OMELET



KALE

SALT

ONION

BLACK PEPPER

EGGS

MCGEE

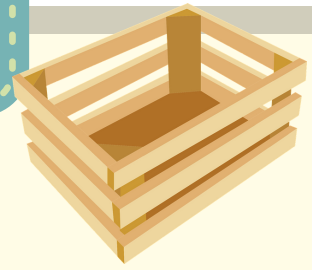
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- 1** CHOP KALE INTO LITTLE PIECES
  - 2** CRACK EGGS INTO A BOWL SEASON WITH MCGEE SALT AND PEPPER AND MIX THE EGGS
  - 3** PUT THE PAN ON THE STOVE WITH MEDIUM HEAT THEN SAUTE ONION UNTIL GOLDEN BROWN AND PUT KALE INTO THE PAN FOR 1 MINUTE
  - 4** PUT EGG INTO THE PAN MIX EVERYTHING UP UNTIL COOKED

**5**

## **SUGGESTION**

ข้อเสนอแนะสำหรับโรงเรียนบ้านห้วยอื่น

# USE OF POTS



## BENEFITS

- SAVE TIME IN PREPARING GARDEN PLOTS
- LESS AREA NEEDED
- EASILY TO MOVE
- EASY FOR STUDENTS TO TAKE CARE
- REUSE EXISTING RESOURCES



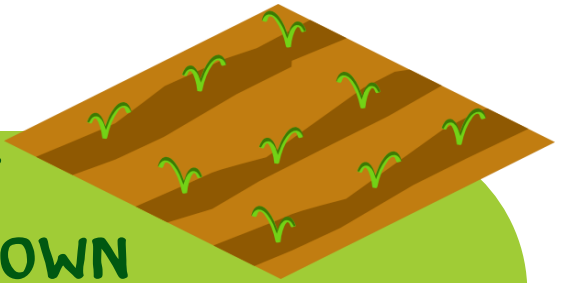
## TIPS



**VERTICAL GARDEN**  
INSTALL ON THE SCHOOL WALL

**TOO DENSE IN THE PLOT..**

**VEGETABLES CAN'T FULLY GROWN**



**1. ONLY PUT IN 2-3 SEEDS PER HOLE**



**2. START PULLING OFF UNHEALTHY PLANTS WHEN THEY START GROWING**

**3. WHEN PLANTS GROWN TALLER, PULL OF AGAIN TO LEAVE APPROPRIATE SPACES BETWEEN THEM**

**THINGS TO CONSIDER BEFORE START PLANTING..**



**1. SEASON**

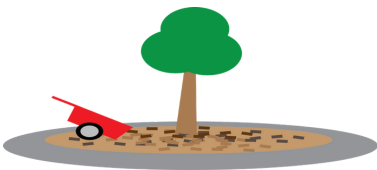
**2. GARDENING PLOTS: SUNLIGHT, PESTS**

**3. AMOUNT OF WATER EACH PLANTS NEEDED**

# GETTING RID OF WEEDS



## MULCH



STRAWS  
LEAVES

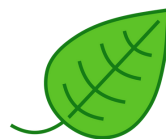


PULL OFF

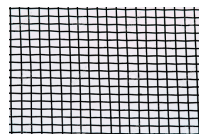
# GETTING RID OF INSECTS



FERMENTED LIQUID

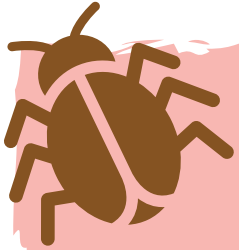


HERBS



NETS

# STRONG ODOR PLANTS CAN REPEL INSECTS



CHILLI

CORIANDER

GARLIC

LETTUCE

CELERY

CITRONELLA

TOMATO

HOLY BASIL

SWEET BASIL

BASIL



# HOW TO KEEP MANURE

## IN A CORRECT WAY



1

PIG MANURE SHOULD BE COLLECTED  
BEFORE WASHING THE PENS



2

USING SHOVELS AND PLASTIC CONTAINERS  
(THAT CAN BE EASILY WASHED)

3

COVER IT WITH PLASTICS IN ORDER TO  
PREVENT ODOR AND INSECTS

4

AFTER TRANSPORTATION, THE SHOVEL  
AND PLASTIC CONTAINERS MUST BE WASHED



DO NOT LET THE CONTAINER FLOOD

# MUSHROOM FARM



## TYPES OF MUSHROOM

STAY MUSHROOM

IOYSTER MUSHROOM

IGOLDEN MUSHROOM

## CONDITIONS



DARK

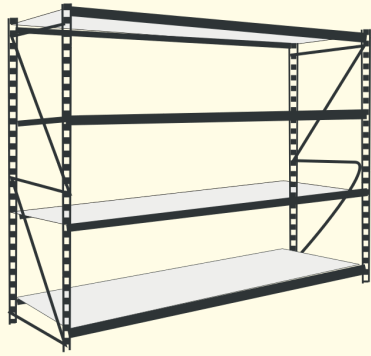


COLD



MOIST

## STEPS TO FOLLOW



1

PREPARE THE SHELF

2

BUY MUSHROOM SPAWN



3

WATERING

WATER FROM TOP TO BOTTOM

4

HARVEST





# INCENTIVE PROGRAMS





# GARDEN OF THE WEEK

- INCREASE STUDENTS INCENTIVE IN TAKING CARE OF THE GARDEN
- THE CONTEST IS BETWEEN EACH GRADE GARDEN

## CRITERIAS

[1–5 POINTS]



STUDENTS TAKE CARE OF THE GARDEN CORRECTLY; DISTANCE THE VEGGIES NICELY, WATER CORRECTLY, GIVE FERTILIZER APPROPRIATELY



STUDENTS TAKE CARE OF THE GARDEN CONSTANTLY



VEGETABLES ARE HEALTHY



STUDENTS STORE AND CLEAN EQUIPMENT NICELY



## BEFORE SCHOOL BREAK...

- PULL OUT ALL PLANTS AND TURNOVER THE SOIL
- MAKE LEAVE FERTILIZERS AND LEAVE OVER THE  
BREAK (CHAP3)
- PREPARE THE SOIL FOR NEXT SEMESTER

## NEW SEMESTER...

- USE THE PREPARED SOIL AND FERTILIZERS
  - START A NEW GARDEN BASED ON THE GUIDELINE BOOK
  - START MAKING ORGANIC FERTILIZERS AND FERMENTED  
LIQUID FOR USAGE DURING SEMESTER(CHAP3)
- 