

The background of the page is decorated with numerous black line-art leaves of various sizes and orientations, scattered across the white space. Each leaf has a central vein and a stem with a small hook. Some leaves have two short curved lines near the stem, suggesting motion or falling. The leaves are distributed around the central text, creating a natural, organic feel.

Urban Agriculture

Activity Manual

Unit one (one week)

This unit aims to introduce students to the basics of planting and planting calendars. This unit will cover the following:

A



The life cycle of a plant

B



The domestication of plants:
From wild to cultivated

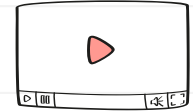
C



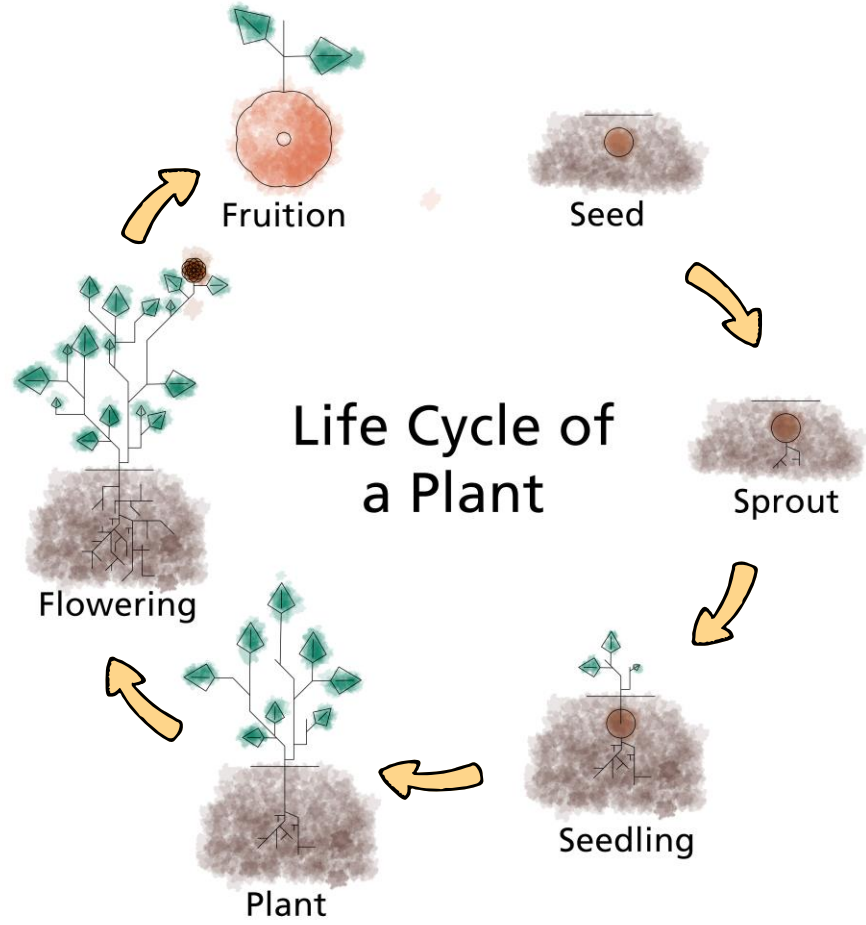
The needs of a plant

A. The life cycle of a plant


View the Dandelion life cycle



Source: *Life for Beginners* | Mark Johnson (<https://youtu.be/OQsfedMrs8>)



Life Cycle of a Plant

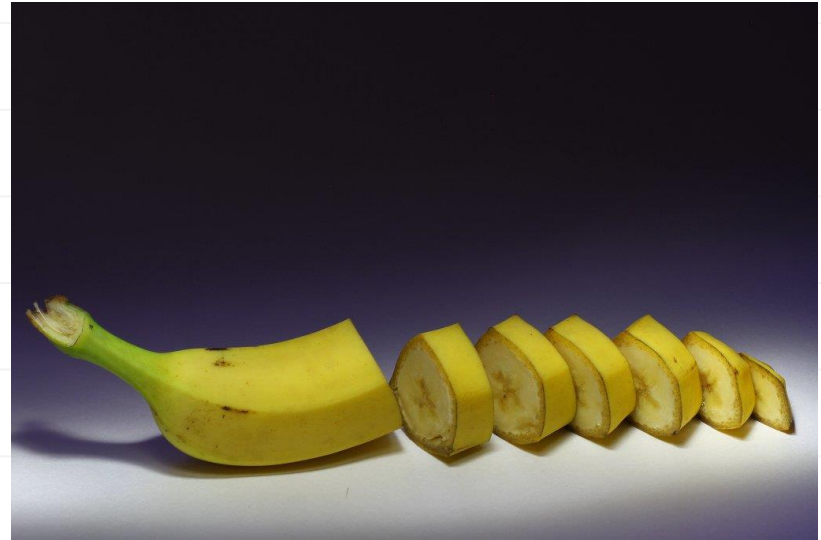


**B. The domestication of plants
from wild to cultivated**



Notice the genetic evolution of these crops through time. What changes do you notice? What are the impacts of these changes on the crops?

Wild banana vs. domesticated banana



Source: [https://www.cell.com/molecular-plant/fulltext/S1674-2052\(19\)30129-7?fbclid=IwAR3BwQWpG16Cc97KnJBBIHdj1xWcp-ikF8hhShyNauwAZjfWbTvtBKzEAM](https://www.cell.com/molecular-plant/fulltext/S1674-2052(19)30129-7?fbclid=IwAR3BwQWpG16Cc97KnJBBIHdj1xWcp-ikF8hhShyNauwAZjfWbTvtBKzEAM)

Wild carrots vs. domesticated carrots



Source: [https://www.cell.com/molecular-plant/fulltext/S1674-2052\(19\)30129-7?fbclid=IwAR3BwQWpG16Cc97KnJBBIHdj1xWcp-ikF8hhShyNauwAZjfWbTvtBKzEAM](https://www.cell.com/molecular-plant/fulltext/S1674-2052(19)30129-7?fbclid=IwAR3BwQWpG16Cc97KnJBBIHdj1xWcp-ikF8hhShyNauwAZjfWbTvtBKzEAM)

Wild corn vs. domesticated corn



Source: [https://www.cell.com/molecular-plant/fulltext/S1674-2052\(19\)30129-7?fbclid=IwAR3BwQWpG16Ccq97KnJBBIHdj1xWcp-ikF8hhShyNauwAZjfWbTvtBKzEAM](https://www.cell.com/molecular-plant/fulltext/S1674-2052(19)30129-7?fbclid=IwAR3BwQWpG16Ccq97KnJBBIHdj1xWcp-ikF8hhShyNauwAZjfWbTvtBKzEAM)

Wild eggplant vs. domesticated eggplant



Source: [https://www.cell.com/molecular-plant/fulltext/S1674-2052\(19\)30129-7?fbclid=IwAR3BwQWpG16Ccq97KnJBBIHdj1xWcp-ikF8hhShyNauwAZjfWbTvtBKzEAM](https://www.cell.com/molecular-plant/fulltext/S1674-2052(19)30129-7?fbclid=IwAR3BwQWpG16Ccq97KnJBBIHdj1xWcp-ikF8hhShyNauwAZjfWbTvtBKzEAM)

Wild watermelon vs. domesticated watermelon



Source: [https://www.cell.com/molecular-plant/fulltext/S1674-2052\(19\)30129-7?fbclid=IwAR3BwQWpG16Ccq97KnJBBIHdj1xWcp-ikF8hhShyNauwAZjfWbTvtBKzEAM](https://www.cell.com/molecular-plant/fulltext/S1674-2052(19)30129-7?fbclid=IwAR3BwQWpG16Ccq97KnJBBIHdj1xWcp-ikF8hhShyNauwAZjfWbTvtBKzEAM)

Wild crops in Jordan



Carob

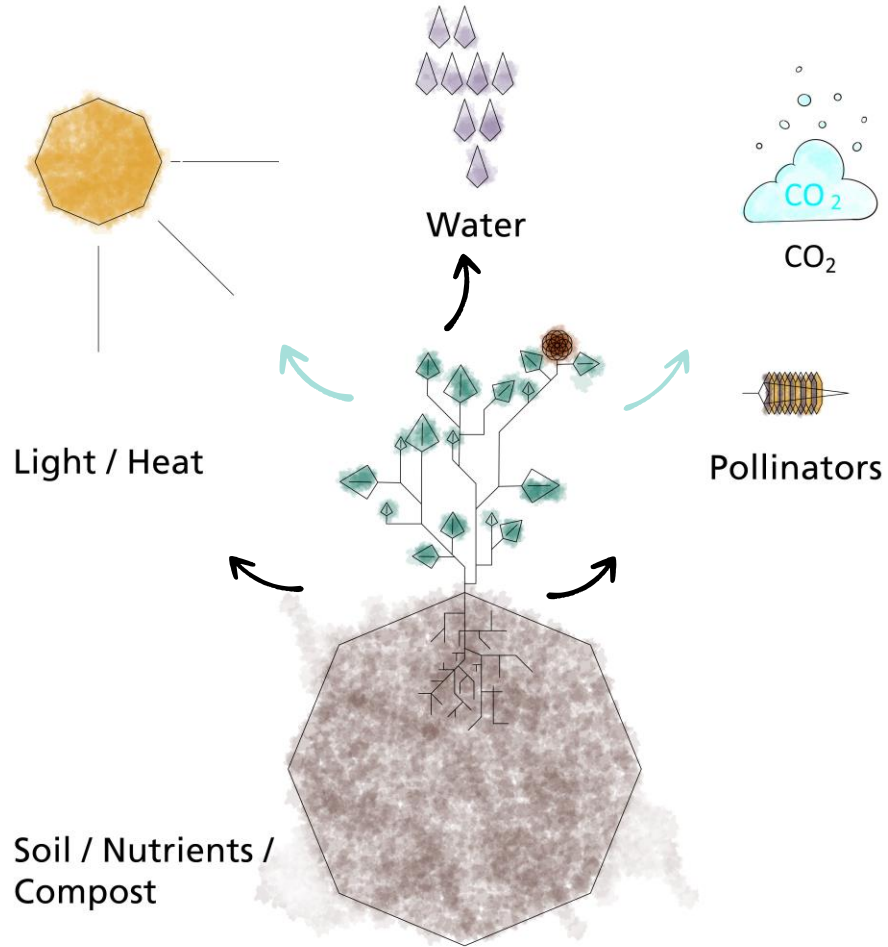


Common Mallow



Fennel

C. The needs of a plant



Unit two (one week)

This unit aims to familiarize students with farming seasonality and simple food systems. The unit will cover the following:

A



The impact of
weather on plants

B



Summer crops
vs. winter crops

A worksheet to recap the basic needs of a plant



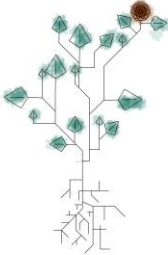
Hand out a copy of the below sheet to every student. Each student should draw and write down the basic needs of a plant. Discuss the correct answers on the class board.

A large rectangular box with a vertical red line on the left side and horizontal lines for writing.

Answer

What are the Basic Needs of a Plant?

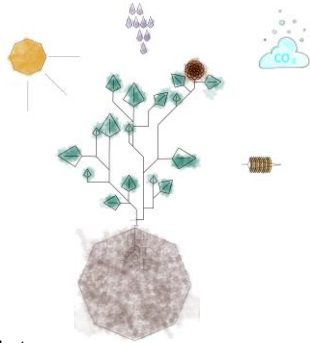
Draw and fill in the blanks



1. _____
2. _____
3. _____
4. _____
5. _____

What are the Basic Needs of a Plant?

Draw and fill in the blanks

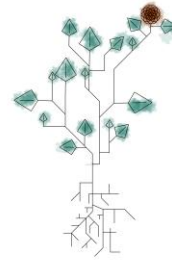


1. Light / Heat
2. Soil / Nutrients / Compost
3. Water
4. CO2
5. Pollinators

Answer

What are the Basic Needs of a Plant?

Draw and fill in the blanks



1. _____
2. _____
3. _____
4. _____
5. _____

A. The impact of weather on plants

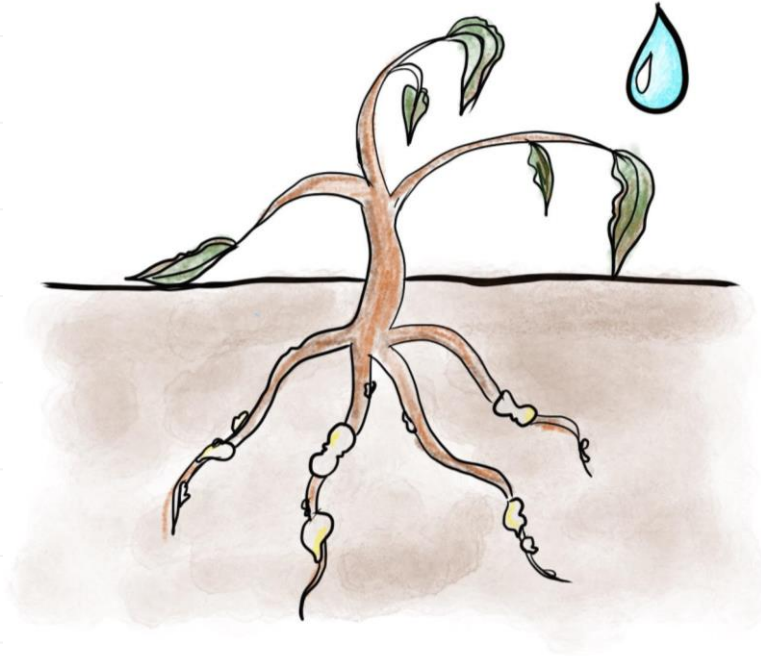
Over-exposure to sunlight will damage
the plant



Under-exposure to sunlight will cause yellowing of leaves, dropping of leaves, or lack of flowering



Over-exposure to water will cause plants to rot and wilt



Under-exposure to water could damage
and kill plants




Heat waves could damage and kill plants



Cold waves could damage and kill plants



What crops do you eat in the following seasons:





   

Winter Fall Spring Summer

___ Oranges ___ pomegranat ___ Apricot ___ Watermelon
Sweet Potato ___ Olives ___ Cherry ___ Cantaloupe ___

Example

What crops do you eat in the following seasons:

Winter Fall Spring Summer

B. Summer crops vs. winter crops

Winter crops

- Beet
- Cabbage
- Carrots
- Cauliflower
- Coriander
- Lettuce
- Onions
- Parsley
- Peas
- Potatoes
- Radish
- Spinach

















Summer crops

- Basil
- Carrots
- Cucumber
- Peppers
- Squash
- Tomato
- Eggplant
- Zucchini

















A large rectangular box with a vertical red line on the left side and horizontal lines for writing, intended for students to write their answers.

Answer

Write each crop's name next to its picture. Notice which plants prosper in winter, which prosper in summer, and which plants prosper during both

















Winter Crops	Summer Crops
_____ 	 _____
_____ 	 _____
_____ 	 _____
_____ 	 _____
_____ 	 _____
_____ 	 _____
_____ 	 _____
_____ 	 _____

Write each crop's name next to its picture. Notice which plants prosper in winter, which prosper in summer, and which plants prosper during both

Winter Crops	Summer Crops
<u>Beet</u> 	 <u>Cucumber</u>
<u>Carrots</u> 	 <u>Okra</u>
<u>Green Onion</u> 	 <u>Bell Pepper</u>
<u>Onion</u> 	 <u>Red Pepper</u>
<u>Garlic</u> 	 <u>Zucchini</u>
<u>Potatoes</u> 	 <u>Tomato</u>
<u>Radish</u> 	 <u>Eggplant</u>
<u>Cabbage</u> 	 <u>Green Pepper</u>

Answer

Write each crop's name next to its picture. Notice which plants prosper in winter, which prosper in summer, and which plants prosper during both

Winter Crops	Summer Crops
<u> </u> 	 <u> </u>
<u> </u> 	 <u> </u>
<u> </u> 	 <u> </u>
<u> </u> 	 <u> </u>
<u> </u> 	 <u> </u>
<u> </u> 	 <u> </u>
<u> </u> 	 <u> </u>
<u> </u> 	 <u> </u>

Unit three (one week)

This unit is intended to inform students how to use a simple seed catalogue as a resource to develop a garden plan, and what is needed to plan and implement a vegetable garden. The unit will cover the following:

A



The main garden supplies and items needed to plan and implement a vegetable garden

B



Creating a seed / seedling / bulb catalogue

C



Planning the vegetable garden

A. The main garden supplies and items needed to plan and implement a vegetable garden

Seeds



Source: https://www.123rf.com/photo_75885859_various-seeds-for-planting-in-the-cells-natural-texture-.html

Seedlings



Source: <https://www.amazon.com/California-Seedling-Medium-Jonsteen-Company/dp/B00HZTSQ96>

Bulbs



Source: <https://www.amazon.com/California-Seedling-Medium-Jonsteen-Company/dp/B00HZTSQ96>

Garden Hoe



Source: http://swsmaterials.com/featured_item/italian-grape-hoe-2/

Axe



Source: <https://www.amazon.com/Columbia-River-Knife-Tool-Camping/dp/B0768T5CVH>

Double-sided Hoe



Source: <https://www.kanbkam.com/sa/ar/bellota%D9%85%D9%86%D9%83%D8%A7%D8%B4-%D9%84%D9%84%D8%B2%D8%B1%D8%A7%D8%B9%D9%87-%D9%85%D9%86-%D8%A8%D9%8A%D9%84%D9%88%D8%AA-21997179>

Spade



Source: <https://www.arabpng.com/png-yi4ogd/download.html>

Rake



Source: https://www.almsal.com/post/736530?fbclid=IwAR2_lxyWVGy4NIFIPFk5OgYqk5J7iVzLdugTzSheoBRV9RAXYOHVJezOqxE

Shovel



Source: https://www.almsal.com/post/736530?fbclid=IwAR2_lxyWVGy4NIFiPFk5OgYqk5J7iVzLdugTzSheoBRV9RAXYOHVJezOqxE

Watering Can



Source: https://www.almsal.com/post/736530?fbclid=IwAR2_lxyWVGy4NIFiPFk5OgYqk5J7iVzLdugTzSheoBRV9RAXYOHVJezOqxE

Gloves



Source: https://www.almsal.com/post/736530?fbclid=IwAR2_lxyWVGy4NIFiPFk5OgYqk5J7iVzLdugTzSheoBRV9RAXYOHVJezOqxE

Labels



Source: <https://youshouldgrow.com/garden-markers/>

C. Creating a seed, seedling, and bulb catalogue

Winter seeds, seedlings, and bulbs catalogue

















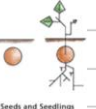





Cut out the images of the crops shown below and match them with their names. Following that, match each crop with its planting method, determining whether it is to be planted using a seed, bulb, tuber, or seedling. Bind the cuttings together to create your own catalogue.





















To be distributed on students

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









Answer

				
				
Potato	Carrots	Green Onions	Garlic	Cabbage
Beet	Radish	Onions	Cauliflower	Parsley

 Tubers	 Seeds	 Bulbs and Seedlings	 Bulbs	 Seeds and Seedlings
 Seeds	 Seeds	 Bulbs	 Seeds and Seedlings	 Seeds

				
Potato	Carrots	Green Onions	Garlic	Cabbage
				
Tubers	Seeds	Bulbs and Seedlings	Bulbs	Seeds and Seedlings
				
Beet	Radish	Onions	Cauliflower	Parsley
				
Seeds	Seeds	Bulbs	Seeds and Seedlings	Seeds

Answer

				
Potato	Carrots	Green Onions	Garlic	Cabbage
				
Beet	Radish	Onions	Cauliflower	Parsley
				
Tubers	Seeds	Bulbs and Seedlings	Bulbs	Seeds and Seedlings
				
Seeds	Seeds	Bulbs	Seeds and Seedlings	Seeds

Summer seeds, seedlings, and bulbs catalogue











Cut out the images of the crops shown below and match them with their names. Following that, match each crop with its planting method, determining whether it is to be planted using a seed, bulb, tuber, or seedling. Bind the cuttings together to create your own catalogue.

A large rectangular area with a red vertical margin line on the left and horizontal lines for writing. It is currently blank.

Answer

A grid of images and a table. The top part shows eight vegetables in a 2x4 grid. Below that is a table with vegetable names. The bottom part shows eight diagrams of seeds and seedlings in a 2x4 grid.

Tomato	Cucumber	Okra	Eggplant
Bell Pepper	Red Pepper	Green Pepper	Zucchini

Seeds and Seedlings diagrams:

- Diagram 1: A seed and a seedling with two leaves. Label: Seeds and Seedlings
- Diagram 2: A seed. Label: Seeds
- Diagram 3: A seed. Label: Seeds
- Diagram 4: A seed and a seedling with two leaves. Label: Seeds and Seedlings
- Diagram 5: A seed. Label: Seeds
- Diagram 6: A seed. Label: Seeds
- Diagram 7: A seed. Label: Seeds
- Diagram 8: A seed and a seedling with two leaves. Label: Seeds and Seedlings



Tomato



Cucumber



Okra



Eggplant



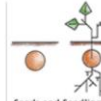
Seeds and Seedlings



Seeds



Seeds



Seeds and Seedlings



Bell Pepper



Red Pepper



Green Pepper



Zucchini



Seeds



Seeds



Seeds



Seeds and Seedlings



Tomato

Cucumber

Okra

Eggplant

Bell Pepper

Red Pepper

Green Pepper

Zucchini



Seeds and Seedlings



Seeds



Seeds



Seeds and Seedlings



Seeds



Seeds











Seeds



Seeds and Seedlings









Answer

Through a vote, decide which crops you will be planting in your summer garden:

							
Tomato	Cucumber	Okra	Eggplant	Green Pepper	Zucchini	Red pepper	Bell Pepper

Example

Through a vote, decide which crops you will be planting in your summer garden:

							
Tomato	Cucumber	Okra	Eggplant	Green Pepper	Zucchini	Red pepper	Bell Pepper

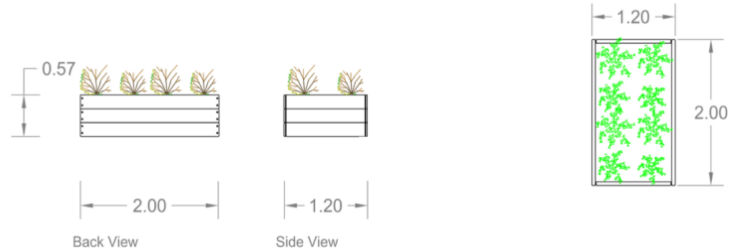
C. Planning the vegetable garden

Recommendations for developing your own planting beds

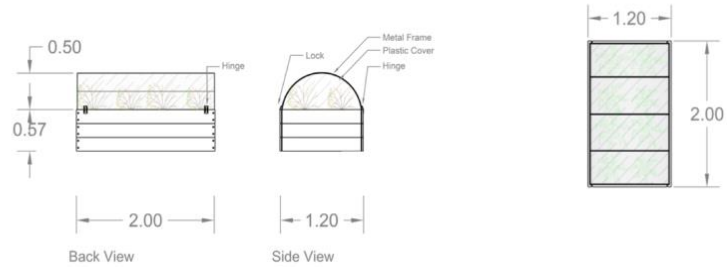
- A suitable width for a typical planting bed is 120 cm. The width should be narrow enough for an outstretched arm to reach the middle of the bed.
- There is no limit on the length of the planting bed.
- The walls of the beds may be made of wood, cinderblock, or plastic.
- Planting pots may be made out of upcycled materials, such as old tires, water tanks, or large polystyrene treys.
- The minimum depth of soil needed in the beds is 30 – 40 cm.
- The soil should be well drained and free of rocks.
- Add organic material to the soil mixture.

Examples of planting bed designs

Type A - Raised Bed



Type B - Raised Bed with Attachable Cover





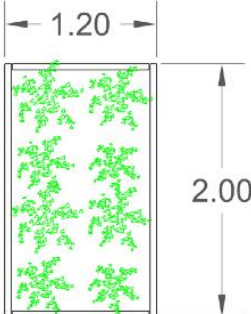
Develop a layout plan of the garden identifying the plants to be included in each bed / pot / area.

Planting bed

- Capacity:
- Selected crops to be planted:

Carrots (four plants) _____

Bell peppers (four plants) _____



1.20

2.00

Example

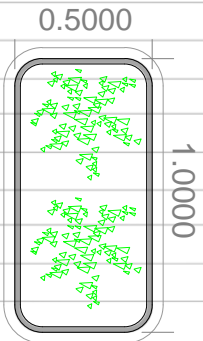
Planting bed

- Capacity:
- Selected crops to be planted:

Planting bed

- Capacity:
- Selected crops to be planted:

—Cucumbers (two plants)—



0.5000

1.0000

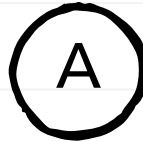
Example

Planting bed

- Capacity:
- Selected crops to be planted:

Unit four (one week)

This unit emphasizes the importance of the constant and regular care of the plants and of the garden as a whole, and reinforces the values of teamwork. Students will be given a list of tasks. They will then form groups and decide which groups are responsible for carrying out which tasks.



Group formation and preparing a care schedule for the garden

**A. Group formation and preparing
a care schedule for the garden**

Group formation table



Divide the class into four groups. Assign all the tasks to be carried out during the week to the groups. Make sure that the tasks rotate between all groups. Hang the final schedules in the classroom so that each group would know their tasks for the upcoming week.

To be hung on the wall

	Group A	Group B	Group C	Group D
Student name	Nour	Sama	Fahed	Zaid
	Farah	Maryam	Mohammad	Taleen
	Riyad	Suzy	Ahmad	Sarah

	Group A	Group B	Group C	Group D
Student name				

Example

List of tasks



Task	Schedule
Watering	Twice a week
Weeding	Weekly
Raking	Weekly
Checking for pests	Weekly
grooming and staking	Biweekly
Harvesting	End of season

To be hung on the wall

Care schedule

	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Group A	Watering	Weeding	Watering Raking	Checking for pests	Watering Trimming and Pruning	Weeding	Watering Raking
Group B	Weeding	Watering Trimming and Pruning	Checking for pests	Watering Raking	Weeding	Watering Trimming and Pruning	Checking for pests
Group C	Watering Raking	Checking for pests	Watering Trimming and Pruning	Weeding	Watering Raking	Checking for pests	Watering Trimming and Pruning
Group D	Checking for pests	Watering Raking	Weeding	Watering Trimming and Pruning	Checking for pests	Watering Raking	Weeding

Example

	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Group A							
Group B							
Group C							
Group D etc.							

Unit five (one week)

This unit engages students in hands-on and physical gardening activities to help them implement what they learned previously in a more comprehensive manner. The unit includes the following:

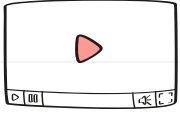


Preparing planting beds, seeds, and soil



Planting activities

A. Presentation introducing greenhouse planting (uses and benefits)



See the first part of CSBE's "Greenhouse Gases and Global Warming" video, which demonstrates how a greenhouse works

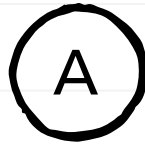


التغير المناخي والاحتباس الحراري

B. Planting activities

Units six (seven weeks)

In this unit, students will regularly care for the plants according to the care schedules they produced. The students will monitor, track, and document the growth of the plants, and write their observations (in the table provided in this unit).



Documenting the growth of plants,
and writing observations

**A. Documenting the growth of
plants, and writing observations**

Documentation table



Hang this table in the classroom. Each group is to fill in the table weekly, documenting which planting bed / pot / area they have worked on, and what tasks they have carried out.

Log template



The students will monitor, track, and document the growth of the plants and write their observations regarding what growth stages the plants are going through, weekly / biweekly documentation through pictures and reports, when are they germinating / flowering / fruiting ...

Log template

Take notes documenting the different growth phases of each plant:

Week	Comments
6	Seeds successfully sprouted.
7	Seedling produced first true <u>leaf</u> , and reached 12 cm in height.
11	Plant produced first flower / number of flowers
... etc.	Plant produced first fruit / number of fruits

Example

Take notes documenting the different growth phases of each plant:

Plant Name: _____ Bed no. _____

Week	Comments

Unit 7 (one week)

In this unit (thirteenth week), students will harvest the crops and prepare a salad or a dish using the harvested produce. They will also collect and store the seeds to be used next season. This unit will include the following:

A



Harvesting

B



Preparing a salad or
a dish

C



General gardening
tips and tricks

A. Harvesting



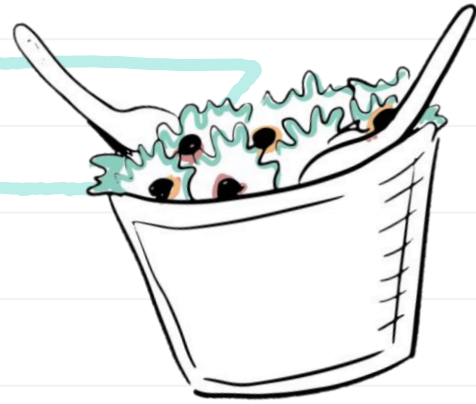
Harvesting tips

- Harvest the crops at the right time, not while raw, nor when they are too ripe.
- Use sharp and clean knives, pruning shears, and trimming scissors.
- Bring trays or reusable baskets and bags to collect your harvest.
- Trim back any extra branches to promote future growth.



B. Let's make a salad!

The salad



Ingredients:

- Vegetables grown in the garden
- Olive oil
- Lemon juice
- Salt

Instructions:

- Wash the vegetables
- With the help of your teacher, cut the vegetables into cubes.
- Add the salt and lemon juice.
- Don't forget to get your plates and forks!

Collecting and storing seeds

- Allow the fruits and vegetables to fully dry out on the plant.
- Cut open the fruits and separate the seeds from the pulp.
- Collect the seeds.
- Rinse the seeds with fresh water.
- Transfer the seeds onto a tray that is lined with paper towels. Label the seeds and allow them to dry in a cool, dry spot for five to six days.
- Store the dry seeds in a zip-lock bag and label them.
- Store the seeds in a cool, dry, and dark spot until they are to be planted.

C. General gardening tips and tricks

1. Water using a drip watering can instead of a hose



Source: <https://www.wikihow.com/Create-a-Vegetable-Garden>
<https://www.wikihow.com/Prevent-Soil-Erosion>

2. Make watering cans out of plastic jugs.



3. Label your seeds / plants



Source: <https://youshouldgrow.com/garden-markers/>

4. Check under the leaves for diseases, and check the soil for pests

If pests are found, implement one of the following solutions:

1. Use a chemical pesticide that is safe to use on edible plants.
2. Create a home-made pesticide mixture containing 5% liquid soap, 5% apple cider vinegar, and 90% water. In both instances, spray the leaves and the areas under the leaves, as well as the areas around the plant.

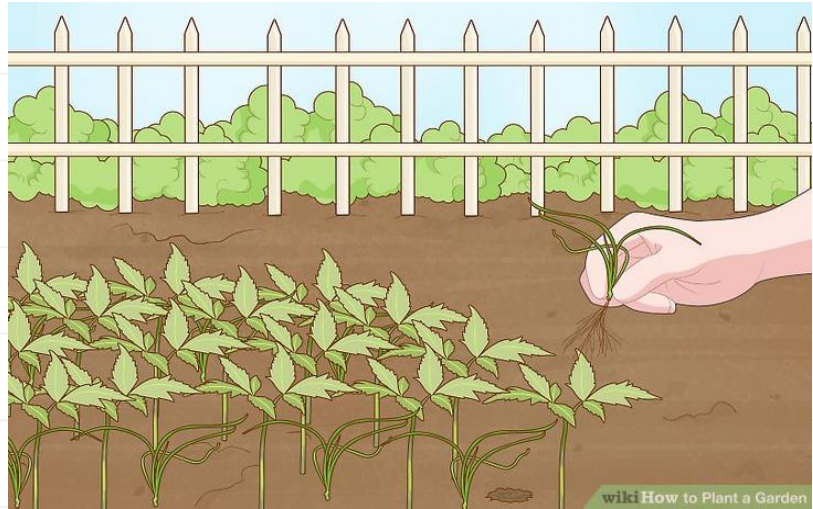


5. Check soil moisture before watering



Source: <https://www.wikihow.com/Choose-the-Best-Time-for-Watering-the-Garden>

6. Keep an eye on invasive plants such as weeds, and root out weeds



Source: <https://www.wikihow.com/Control-Pests>
<https://www.wikihow.com/Plant-a-Garde>

7. Protect the plants from extreme weather conditions (cover them with plastic bags during the freezing season, and / or bring them indoors during extreme weather conditions)



Source: <https://www.wikihow.com/Protect-Plants-from-the-Cold>

8. Water in the early morning period to avoid leaf burns and moisture loss



9. Space the plants adequately apart from each other

10. Spread mulch around the plants

11. Use a fertilizer

Thank you!

