

Your Goal

Your goal is to design and build a growth chamber for vegetable seedlings and then determine how well seeds grow in your chamber.

What You Need to Know

There are two parts to this project.

First, you must plan and design your growth chamber. Some materials and equipment that might be useful include:

- seeds (beans, corn)
- hydroponic solution
- building materials such as cardboard, wood, cellophane or plastic wrap, tape, glue, hinges, nails, screws
- building tools
- plant pots and/or trays
- light source such as a window, a lamp, or fluorescent lights
- various soil types and additives such as perlite or vermiculite

For your growth chamber to be effective, it must

- be large enough to hold at least six vegetable seedlings
- have a light source
- provide a moist environment
- provide appropriate soil

Second, you must plant some seeds in your growth chamber and allow the seedlings to grow for at least three weeks.

Steps to Success



- 1 In a group, list the needs of plants for growth.
- 2 As a group, develop a safe plan or design for your growth chamber.
- 3 Draw a side view, front view, and top view of your plan. (See Toolbox 8 for help with drawing diagrams.)
- 4 Choose and safely use appropriate materials, tools, and equipment when building your growth chamber.
- 5 Once your chamber is built, plant your seeds.
- 6 Record your observations of the seedling growth in your chamber several times a week for three weeks.

How Did It Go?

- 7 Display your completed growth chamber in your classroom.
- 8 Compare your chamber with those of your classmates. Are there any features in their designs that work particularly well?
- 9 If you were to build the chamber again, is there anything you would change? If so, state what it is and explain why you would change it.
- 10 Write a report or prepare a poster that includes your labelled scale drawings, the soil mixture used, the plant growth over a three-week period, and comments on the success or failure of your design. You may want to include a graph of plant growth as well as a description of any features you would change if you were to build this again.





UNIT REVIEW: PLANTS FOR FOOD AND FIBRE

Unit Vocabulary

1. Write a short story describing the life cycle of a plant using the following terms:

soil
sandy
root
leaf
flower
pollinate
pest control
photosynthesis

Check Your Knowledge

1.0

2. Draw and label a diagram of a seed plant.
3. How do plants make their food?
4. What is transpiration?
5. What function takes place only in the adult stage of a seed plant?
6. Describe one way that a seed plant can reproduce without seeds.

2.0

7. Plants make two things that the rest of life depends on. What are they?
8. Why do humans need plants?
9. Why is a forest a living resource?
10. What do plants need to survive?

3.0

11. Draw and label a diagram that shows the characteristics of clay soil.
12. Does plowing help or damage the soil? Explain your answer.

4.0

13. A flower is growing in a dry area of your garden. Describe two ways that you could modify the environment to make sure the flower gets enough water.
14. Describe hydroponics. What is left out when plants are grown by hydroponics?
15. Selective breeding
 - a) is a process used by scientists
 - b) is a process used by growers in agriculture and horticulture
 - c) both a) and b)
16. Logging provides us with many useful things, like paper and wood. Describe one unintended consequence of logging.
17. Is using pesticide for a long time sustainable? Explain your answer.

Connect Your Understanding

18. Last week, someone put all their paper in the garbage instead of recycling it. What effect might this have on the amount of natural forest in Alberta?
19. When you are shopping with your parents, you see some organically grown vegetables. They ask if you want to get some. What do you tell them? Why?

20. Great! There is a new variety that produces giant zucchinis.
- What plant structure is changed in this variety?
 - What growing conditions do you predict would need to be changed to get a giant zucchini?
21. In the newspaper, you read that protesters are trying to stop a company from logging a forest.
- What will be the environmental consequences if they are successful?
 - Will there be any economic or social consequences if they succeed? Explain.

Practise Your Skills

22. In Canada, most farmland is in the south, where lots of people live. You are a genetic engineer who is considering putting a gene into corn from a plant that grows well in cold weather. This would make corn that could grow in the Arctic, where there are fewer people.
- Would growing corn in the Arctic have any unintended consequences? Explain your answer.
 - Would you eat genetically engineered corn? Why or why not?

Self Assessment

Think back to the work you did in this unit.

23. Are new technologies always developed by scientists and engineers? Provide an example with your answer.
24. Do you think that we are getting more careful or less careful about affecting the environment? Why?

**Focus
On**

SCIENCE AND TECHNOLOGY

In this unit, you investigated the role of science and technology in growing and harvesting the plants we need while maintaining the environment. Think about this in relation to the following questions.

25. Give two examples of technology that improved the amount or quality of plants that we grow or harvest.
26. Describe some methods of producing plants that have less environmental impact. Are these the fastest and easiest methods?
27. Reread the three questions on page 97 about the science and technology context. Use a creative way to demonstrate your understanding of one of the questions.