

Important Concepts . . .

Preview Review



Science

Grade 7 TEACHER KEY

**W2 - Lesson 1: Life Processes and
Structure of Plants**

Important Concepts of Grade 7 Science

W1 - Lesson 1	Interactions and Interdependencies
W1 - Lesson 2	Nutrient Cycles, Energy Flows, and Changes in Ecosystems
W1 - Lesson 3A	Environmental Impacts of Human Activities
W1 - Lesson 3B	The Particle Model of Matter, Temperature, Heat, and Change of State
W1 - Lesson 4	Heat Transfer
W1 - Lesson 5	Understanding Heat and Temperature in Nature and Technology
W1 - Quiz	
W2 - Lesson 1	Life Processes and Structure of Plants
W2 - Lesson 2	Plant Propagation and Reproduction
W2 - Lesson 3	Plant Needs and Growing Conditions
W2 - Lesson 4	Role of Plants and Controlling Plant Growth
W2 - Lesson 5	Review of Plant Management
W2 - Quiz	
W3 - Lesson 1	Forces on and within Structures
W3 - Lesson 2	Structural Forms
W3 - Lesson 3A	Materials Used in Structures
W3 - Lesson 3B	Rocks, Weathering, and Erosion - The Rock Cycle
W3 - Lesson 4	Plate Tectonics and Related Events
W3 - Lesson 5	Fossils
W3 - Quiz	

Materials Required.

Textbook:
Science in Action 7

Science Grade 7

Version 5

Preview/Review W2 - Lesson 1 TEACHER KEY

Publisher: Alberta Distance Learning Centre

In-House Teacher: Barb Philips

Reviewer: Norene Pinder

Project Coordinator: Dennis McCarthy

Preview/Review Publishing Coordinating Team: Nina Johnson,

Laura Renkema, and Donna Silgard



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Preview/Review Concepts for Grade Seven Science

TEACHER KEY



*W2 - Lesson 1: Life Processes
and Structure of Plants*

OBJECTIVES

By the end of this lesson, you should be able to

- identify and describe basic plant parts
- explain and identify what an adaptation is and predict adaptations of plants living in specific conditions
- define basic life processes in plants

GLOSSARY

adaptation - a change in an organism that makes it better suited to an environment

cellular respiration - the breakdown of glucose by cells to release energy for the cell's use

diffusion - the movement of particles from an area of high concentration to an area of low concentration

osmosis - the diffusion of water across a semi-permeable membrane

photosynthesis - the process plants use to make their own food using light, carbon dioxide, and water

transpiration - the evaporation of water from pores of a plant

Introductory Information for Teachers

Preview/Review courses are aimed mainly at students who have complete the regular course but who need to review before beginning the next grade. Other students may find Preview/Review courses useful in preparing for the new materials they will study in their next grade. No Preview/Review course is intended to replace the regular course because all cover only some important concepts from the Program of Studies for each grade.

Preview/Review materials are intended for use by teachers in one-subject and one-grade classrooms.

This Preview/Review course contains fifteen lessons in three sections. Each section has five lessons with homework. A short quiz is provided at the end of each section to test students' knowledge of the material studied. In a classroom, the course will likely be completed in three weeks.

Students may attend one, two, or all three sections. Because Science has five units per grade and does not divide into three sections, Sections 1 and 2 cover two units each and Section 3 covers the final unit.

In Science, textbooks are central to Preview/Review. That is, the textbook must be read and used to complete the activities proficiently.

Textbooks required:

- Grade 7: *Science in Action 7*
- Grade 8: *Science in Action 8*
- Grade 9: *Science in Action 9*

W2 - Lesson 1: Life Processes and Structure of Plants

Plants have some common parts regardless of type. They also carry out a number of processes in order to maintain life.

Plant Structure

If you carefully pull any small plant out of the soil and look at it closely, you will find certain standard parts on it. They include roots, stems, leaves, and reproductive parts. This lesson takes a closer look at them and how they can be identified as well as what they do for the plant.

1. Read page 101 of *Science in Action 7* and describe the appearance and functions of each of the following plant parts.
 - a. stems *connect roots and leaves, support*
above-ground plant parts
 - b. leaves *usually green or partly green, contain*
openings for gas exchange and water release, site of
photosynthesis
 - c. roots *hold plant in soil, site of water and*
nutrient absorption, lots of surface area.
 - d. cones *reproductive organs of coniferous plants.*

 - e. flowers *reproductive organs in flowering plants.*
Can be conspicuous or not noticeable. Come in
many shapes and colours.
 - f. seeds *come in many shapes and sizes. Contain the*
embryo that can grow into a new plant

Adaptation

Read pages 118-120 in the textbook. Because of conditions that a plant species has been exposed to over time, changes in its structure may have occurred. These changes are called **adaptations**. They help improve the plant's chances of survival in a particular environment.

2. How do you expect the leaves of a plant that lives in the desert to be modified to help the plant survive in dry conditions?

The leaves may have a thickened, waxy outer layer to prevent water loss; and may be fleshy to store water.

3. If you have a plant that relies on insects to help it reproduce, (pollinate it) what sorts of characteristics would you expect to find in its flowers?

Flowers may be colourful, scented, and shaped to resemble insects to attract insects.

4. What kinds of adaptations does a flowering plant that lives on the Tundra in Canada's far north need?

small size, fast reproductive cycle, shallow root system

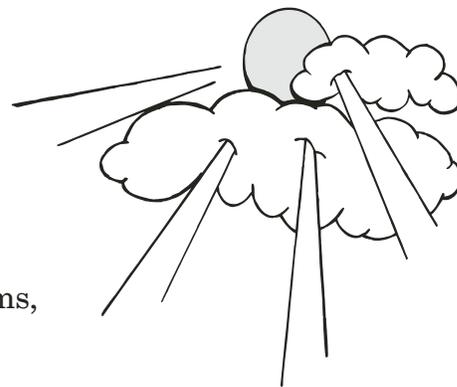
5. Why do the leaves of spruce and pine have a coating of resin?

To conserve water (prevent it escaping).



Life Processes

The process that probably comes to mind first when discussing plants, is **photosynthesis**. Read page 104 of the textbook. During photosynthesis, plants trap solar energy (sunlight), which is not usable by living organisms, and convert it to chemical energy (glucose), which is usable.



6. In addition to light energy, what substances must plants have for photosynthesis?

Carbon dioxide and water

7. Write the word equation for what happens during photosynthesis.

Water + carbon dioxide + sunlight → glucose (sugar) + oxygen

8. In which part of the plant does photosynthesis occur?

In the chloroplasts, which are found mainly in leaves.

9. **Cellular respiration** is often thought of as the opposite of photosynthesis. Read page 104 of the textbook. In this process, sugar the plant made during photosynthesis is broken down in the presence of oxygen. When this happens, energy is released for use by the plant. Write the word equation for what happens in cellular respiration.

oxygen + glucose → carbon dioxide + water + energy



How Plants Move Matter



Other processes within plants involve moving material into and out of cells and the plant. These processes include diffusion, osmosis, capillary action, active transport, and transpiration. **Diffusion** is the movement of particles from an area of high concentration to an area of lower concentration. It is important for moving many substances into or out of cells. **Osmosis** is a special kind of diffusion—the diffusion of water across a semi-permeable membrane. This is how water moves into a root and into or out of cells. Some particles do not diffuse into or out of cells. They require a carrier molecule and the addition of energy. This is called **active transport**. Read pages 103, 106, and 107 of the textbook for details.

10. Compare and contrast diffusion and osmosis.

They both involve the movement of particles from an area of high concentration to one of low concentration.

Neither requires the input of energy. Diffusion can involve any particles. Osmosis is a special form of diffusion where water diffuses across a semipermeable membrane.

11. How does active transport differ from osmosis and diffusion?

It is the movement of particles across a membrane using special “carrier molecules” and additional energy. It moves particles against the concentration gradient, that is, from where there is a lower concentration to where there is a higher concentration of the particle.



12. How does a plant “breathe”?

Through small pores in the stems and leaves

Water moves through transport tubes in a plant partly by **capillary action**. Attraction between the water particles and the tubes pulls the water along. When water reaches a pore to the outside of a plant, it evaporates into the air. This process is called **transpiration**. Because water particles are attracted to each other, as one particle evaporates it pulls up another to take its place. Read page 103 of your textbook.

13. Describe how water moves up a plant stem by capillary action.

Water particles are attracted to each other and the sides of the tube (xylem) they are moving through. So, as a particle is pulled up by particles above it, it also is pulling up particles below it.

14. Why does a plant wilt?

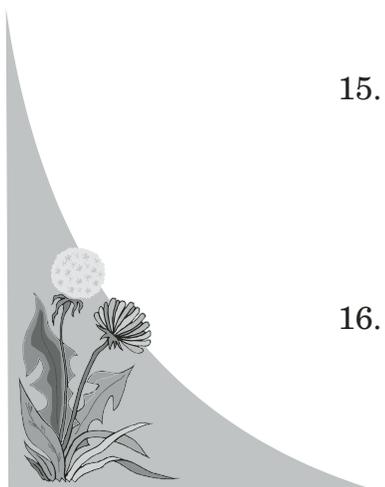
More water is leaving through transpiration than is entering through diffusion.

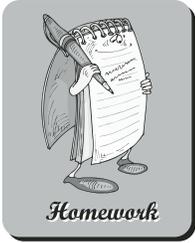
15. If water concentration is higher inside a cell than outside, where will water move?

out of the cell

16. Define gas exchange.

Oxygen leaving and carbon dioxide entering the plant.





You have learned about plant structure and life processes. Your homework will demonstrate your understanding.

Homework

Examine two different types of plants. On each plant identify the parts that you learned about. How are the parts of the two plants different? How are they the same?

Answers will vary but there should be a lot of differences.
