**ASSIGNMENT BOOKLET 3C**

SCN1270 Science 10
Module 3: Section 3 Assignment

### FOR STUDENT USE ONLY

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<tbody>
<tr>
<td>Date Assignment Submitted:</td>
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<td>Time Spent on Assignment:</td>
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<td>Student File Number:</td>
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<td>Module Number:</td>
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### FOR OFFICE USE ONLY

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<tr>
<td>Assigned Teacher:</td>
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<td>Assignment Grading:</td>
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<td>Date Assignment Received:</td>
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**Student's Questions and Comments**

**Teacher's Comments**

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**Apply Module Label Here**

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**Name**

**Address**

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- Are all the assignments completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
- Is the booklet cover filled out and the correct module label attached?

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1. Assignment Booklets may be faxed to the school with which you are registered. Contact your teacher for the appropriate fax number.

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Module 3
Cycling Matter in Living Systems
Assignment Booklet 3C
<table>
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<tr>
<th>Summary</th>
<th>Teacher's Comments</th>
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</thead>
<tbody>
<tr>
<td><strong>Total Possible Marks</strong></td>
<td><strong>Your Mark</strong></td>
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<tr>
<td>Section 3 Assignment</td>
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Science 10  
Module 3: Cycling Matter in Living Systems  
Assignment Booklet 3C  
Section 3 Assignment  
Learning Technologies Branch  
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You may find the following Internet sites useful:  
- Learning Resources Centre, [http://www.lrc.education.gov.ab.ca](http://www.lrc.education.gov.ab.ca)  

Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.
ASSIGNMENT BOOKLET 3C
SCIENCE 10: MODULE 3
SECTION 3 ASSIGNMENT

This Assignment Booklet is worth 56 marks out of the total 130 marks for the assignments in Module 3. The value of each assignment and each question is stated in the left margin.

Read all parts of your assignment carefully and record your answers in the appropriate places. If you have difficulty with an assignment, go back to your Student Module Booklet and review the appropriate lesson. Be sure to proofread your answers carefully before submitting your Assignment Booklet.

Section 3 Assignment: Plants Are Multicellular Organisms with Specialized Structures

For questions 1 to 4, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

1. An example of xylem tissue is
   A. openings in leaves
   B. long fibres in celery
   C. cells that covers the surface of leaves
   D. small projections extending from roots

2. Long tubes that carry water and sugar from leaves to the rest of the plant are known as
   A. phloem tissue
   B. xylem tissue
   C. dermal tissue
   D. ground tissue

3. Which is not part of the shoot system?
   A. cuticle
   B. root hair
   C. stomata
   D. xylem

4. Tissue that lies beneath the epidermis and makes up the majority of the plant is called
   A. cuticle tissue
   B. dermal tissue
   C. ground tissue
   D. vascular tissue
5. Label the following cross section of a plant stem using terms from the list provided.

- xylem
- stomata
- ground tissue
- epidermis
- phloem
- companion cells
- vascular bundle
- guard cells

6. Match each function with the correct structure from the following list.

i. cuticle  
ii. stomata  
iii. xylem  
iv. root hairs  
v. ground tissue  
vi. companion cells  
vii. epidermis  
viii. guard cells

- a. moves water and dissolved minerals from roots up the stem to the leaves
- b. outer layer that covers all of non-woody plants; responsible for the exchange of matter and gases into and out of plants
- c. form tiny pores on the under side of leaves
- d. tiny pores on the under side of leaves that allow for movement of gases in and out of leaves
- e. prevents excess evaporation of water
- f. directs activities of sieve tube cells
- g. increases absorption capacity of roots
- h. provides strength and support for plant; stores food and water for plant; is the location of photosynthesis

Return to page 100 of the Student Module Booklet and begin Section 3: Lesson 2.
For questions 7 to 12, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

7. The organelles where photosynthesis takes place are
   A. xylem
   B. chloroplasts
   C. chlorophyll
   D. vascular bundles

8. Which is a reactant in the process of photosynthesis?
   A. carbon dioxide
   B. chlorophyll
   C. oxygen
   D. glucose

9. How many chloroplasts are present in a typical plant cell?
   A. 2 to 4
   B. 20 to 40
   C. 200 to 400
   D. 2000 to 4000

10. Cells directly obtain energy to fuel their activities from
    A. photosynthesis
    B. cytoplasmic streaming
    C. cellular respiration
    D. cellular transport

11. A vial with water, bromothymol blue, carbon dioxide, and a plant are left for 24 hours in the light. The colour of the solution turns from yellow to blue. This colour change is due to the plant
    A. releasing oxygen into the solution through cellular respiration
    B. releasing carbon dioxide into the solution through photosynthesis
    C. removing oxygen from the solution by cellular respiration
    D. removing carbon dioxide from the solution by photosynthesis

12. Two vials with water, bromothymol blue, and a snail are left for 24 hours, one in the light and one in the dark. The colour changes from blue to green or yellow in both vials because the snail
    A. uses oxygen from the solution
    B. uses carbon dioxide from the solution
    C. releases oxygen into the solution
    D. releases carbon dioxide into the solution
13. Balance the equation for cellular respiration by writing the correct number in the blank spaces given.

\[ C_6H_{12}O_6(aq) + \text{____} O_2(g) \rightarrow \text{____} CO_2(g) + \text{____} H_2O(l) + \text{energy} \]

For questions 14 to 18, read each question carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

14. Specialized cells that regulate the movement of water and other gases in and out of the leaf of the plant are known as

A. guard cells  
B. mesophyll cells  
C. palisade cells  
D. companion cells

15. The process of water vapour leaving a leaf through the stomata is called

A. transpiration  
B. transportation  
C. respiration  
D. diffusion

16. When a potassium ion (K\(^+\)) enters a guard cell, it creates a solution of

A. high water concentration inside the guard cells  
B. low water concentration inside the guard cells  
C. low water concentration outside the guard cells  
D. low ion concentration inside the guard cells

17. Plants that grow in low-moisture climates have

A. few stomata  
B. a large number of leaves  
C. a large number of stomata  
D. long stems

18. Cells responsible for the majority of photosynthesis in the leaf are called

A. epidermal cells  
B. spongy layer cells  
C. palisade tissue cells  
D. guard cells
19. Decide whether each statement is true (T) or false (F). Place your answer in the blank space given.

_____ a. Gas exchange in all plants occurs only through the leaves.

_____ b. Spongy layer cells are loosely packed so air can move between the cells.

_____ c. Leaves do not contain vascular tissue.

_____ d. Palisade tissue cells contain chlorophyll.

_____ e. The opening and closing of stomata is sometimes regulated by the amount of carbon dioxide available.

_____ f. When guard cells become turgid, the stomata close.

Return to page 123 of the Student Module Booklet and begin Section 3: Lesson 4.

For questions 20 to 26, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

_____ 20. The attraction of water molecules to other water molecules is known as

A. adhesion
B. cohesion
C. osmosis
D. capillary action

_____ 21. Water seen early in the morning only on the tip of a blade of grass is due to

A. active transport
B. turgor pressure
C. capillary action
D. root pressure

_____ 22. Transpiration is due to

A. root pressure
B. excess ground water
C. excess moisture in the air
D. evaporation of water through stomata and lenticels
23. A solution outside the cell that is hypotonic to the cell contents will cause
A. water to move into the cell
B. water to move out of the cell
C. sugar to move into the cell
D. a decreased evaporation rate in the leaves

24. Water moves into phloem cells by osmosis and creates an increased pressure that pushes the sugar and water in the phloem to the rest of the plant. This description of moving materials through the phloem is called
A. phloem theory
B. pressure difference
C. pressure-flow theory
D. active transport

25. Which two forces cause water and minerals to move up the xylem?
A. source and sink
B. osmosis and active transport
C. plasmolysis and pressure differences
D. root pressure and transpiration pull

26. What will you observe when the solution outside a cell has a higher solute concentration than the contents of the cell?
A. increasing turgidity of the cell wall
B. the expansion of the central vacuole and movement of the cell contents to the cell wall
C. the shrinking of the central vacuole and movement of the cell contents away from the cell wall
D. no change in the shape or size of the central vacuole or cell wall

27. Why does cutting through the bark of a tree often kill the tree?
28. Complete the following table.

<table>
<thead>
<tr>
<th>Location</th>
<th>Substance(s) Moved</th>
<th>Mechanism for Movement</th>
</tr>
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<tbody>
<tr>
<td>leaves</td>
<td>sugar</td>
<td>active transport</td>
</tr>
<tr>
<td>leaves</td>
<td>water</td>
<td></td>
</tr>
<tr>
<td>phloem</td>
<td></td>
<td>pressure difference</td>
</tr>
<tr>
<td>root</td>
<td>sugar</td>
<td></td>
</tr>
<tr>
<td>root</td>
<td></td>
<td>osmosis</td>
</tr>
<tr>
<td>xylem</td>
<td>water and minerals</td>
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</tbody>
</table>

Return to page 136 of the Student Module Booklet and begin Section 3: Lesson 5.

For questions 29 to 33, read each question carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

29. Signals that organisms respond to are called

   A. stimuli  
   B. tropisms  
   C. control systems  
   D. phototropism

30. A plant bends toward a light source as it grows. This is an example of

   A. positive gravitropism  
   B. negative gravitropism  
   C. positive phototropism  
   D. negative phototropism

31. A corn seed is germinated in the dark. The root grows in a downward direction. This shows the effect of

   A. positive gravitropism  
   B. negative gravitropism  
   C. positive phototropism  
   D. negative phototropism
32. The tip of the stem of an oat leaf plant is covered with aluminium foil. A light source from one side will
A. cause the stem to bend toward the light source
B. cause the stem to bend away from the light source
C. cause the stem to wither and die
D. have no effect on the stem

33. The phototropic response to light occurs
A. at the tip of the stem
B. at the base of the stem
C. part way down the stem
D. in the root of the plant

34. Determine whether each statement is true (T) or false (F). Place your answer in the blank space given.

a. F. W. Went isolated the chemical substance responsible for communicating stimulus information.
   F. W.

b. The chemical substance responsible for communicating stimulus information is a hormone.
   T.

c. Charles and Francis Darwin confirmed that the tip of a plant stem is responsible for initiating the phototropic response.
   T.

d. When the tip of a stem is covered with a transparent cap, the stem bends toward the light source anyway.
   T.

e. When the base of a stem is covered with an opaque shield, the stem bends away from the light source.
   F.

f. An example of another control mechanism is that some plants require more than 12 hours of darkness to produce flowers.
   T.
35. Write the following terms in the correct blank on the diagram.

- seed
- root
- stem
- negative phototropism
- positive phototropism
- negative gravitropism
- positive gravitropism

Submit your completed Assignment Booklet 3C to your teacher for assessment.