

BIOLOGY 12 SELF-PACED ONLINE

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SCHEDULE: Tuesday 10:00am-2:00pm; 5:00pm-9:00pm
Thursday 10:00am-2:00pm; 5:00pm-9:00pm
LEARNING CENTRE HOURS: Monday-Thursday 10:00am-2:00pm
Monday-Thursday 5:00pm-9:00pm
The Learning Centre is closed all statutory and school holidays.

INTRODUCTION

Biology 12 is an overview of human anatomy and physiology from the molecular level to the organ system level. The first part of the course covers cell structure and function. The second part covers basic human anatomy and physiology. The underlying theme of the course is homeostasis – the maintenance of a steady state within the organism.

PRESCRIBED LEARNING OUTCOMES

Processes of Science:

- A2 *design an experiment using the scientific method*
- A3 *interpret data from a variety of text and visual sources*

Cell Structure:

- B1 *analyse the functional inter-relationships of cell structures*

Cell Compounds and Biological Molecules:

- B2 *describe the characteristics of water and its role in biological systems*
- B3 *describe the role of acids, bases, and buffers in biological systems in the human body*
- B4 *analyse the structure and function of biological molecules in living systems, including carbohydrates, lipids, proteins, and nucleic acids*

DNA Replication:

- B5 *describe DNA replication*
- B6 *describe recombinant DNA*

Protein Synthesis:

- B7 *demonstrate an understanding of the process of protein synthesis*
- B8 *explain how mutations in DNA affect protein synthesis*

Transport across Cell Membrane:

- B9 *analyse the structure and function of the cell membrane*
- B10 *explain why cells divide when they reach a particular surface area-to-volume ratio*

Enzymes:

- B11 *analyse the roles of enzymes in biochemical reactions*

Digestive System:

- C1 *analyse the functional inter-relationships of the structures of the digestive system*
- C2 *describe the components, pH, and digestive actions of salivary, gastric, pancreatic, and intestinal juices*

Circulatory System:

- C3 *describe the inter-relationships of the structures of the heart*
- C4 *analyse the relationship between heart rate and blood pressure*
- C5 *analyse the functional inter-relationships of the vessels of the circulatory system*
- C6 *describe the components of blood*
- C7 *describe the inter-relationships of the structures of the lymphatic system*

Respiratory System:

- C8 *analyse the functional inter-relationships of the structures of the respiratory system*
- C9 *analyse the processes of breathing*
- C10 *analyse internal and external respiration*

Nervous System:

- C11 *analyse the transmission of nerve impulses*
- C12 *analyse the functional inter-relationships of the divisions of the nervous system*

Urinary System:

- C13 *analyse the functional inter-relationships of the structures of the urinary system*

Reproductive System:

- C14 *analyse the functional inter-relationships of the structures of the male reproductive system*
- C15 *analyse the functional inter-relationships of the structures of the female reproductive system*

LEARNING RESOURCES

The information needed to complete the objectives of Biology 12 is presented online in the Moodle website. You are provided with a textbook 'Inquiry into Life' by Sylvia Mader to fill in any extra information needed.

The individual unit objectives specify the information that must be mastered for each unit. Please note, biology textbooks/online courses often contain a lot of information in the charts, diagrams and figures that is not included in the written material, so be sure to look there for information as well.

There are also extra practice questions available for each unit to help you prepare for your tests.

BIOLOGY 12 Self-Paced Online at CLOC

Biology 12 at Coquitlam Learning Opportunity Centre is a self-paced, self-directed course. You will be expected to work independently and to manage your time productively. If needed, individual help is available from the biology instructors at the Learning Centre. You may contact your instructor in person during scheduled hours at CLOC or by email.

UNITS OF STUDY

<u>UNIT</u>	<u>CONTENT</u>
1	Homeostasis, Cell Structure
2	Biological Molecules
3	DNA, RNA, Protein Synthesis, rDNA
4	Transport across Membranes
5	Experimental Design, Enzymes
6	Cells, Tissues, Organs, Digestive System
7	Circulatory System
8	Blood
9	Respiratory System
10	Excretory System
11	Nervous System
12	Reproductive System

EVALUATION

Evaluation in Biology 12 includes 12 unit tests, 3 midterm tests, and a final exam. All tests contain both multiple-choice and written-response questions. You will be expected to recognize and label molecules and diagrams. ONE REWRITE is available for each unit test. The midterms are not cumulative and may contain questions that connect more than one unit. There are NO REWRITES for the midterms. The final exam covers the entire course. There is NO REWRITE for the final exam. The tests will be weighted as follows:

<u>TEST</u>	<u>CONTENT</u>	<u>PERCENT</u>
Unit 1	Homeostasis, Cells	5
Unit 2	Biological Molecules	5
Unit 3	DNA, RNA, Protein Synthesis, rDNA	4
Unit 4	Transport across Membranes	4
Midterm 1	Units 1–4	9
Unit 5	Experimental Design, Enzymes	3
Unit 6	Cells, Tissues, Organs, Digestive System	4
Unit 7	Circulatory System	4
Unit 8	Blood	4
Midterm 2	Units 5–8	9
Unit 9	Respiratory System	3
Unit 10	Excretory System	4
Unit 11	Nervous System	4
Unit 12	Reproductive System	4
Midterm 3	Units 9–12	9
Final Exam	Units 1–12	25
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TEST TERMS

The following terms may turn up in questions on the Biology 12 tests.

Compare Look for **similarities and differences** between items to be compared. If using sentence format there should be one comparison per sentence. Each comparison has **two** parts to it.

Q. Compare red and white blood cells.

A. White blood cells are nucleated whereas red blood cells are not.

Both white and red blood cells are produced in red bone marrow.

Another way to answer a comparison question is to set up a table.

	White Blood Cells	Red Blood Cells
Presence of Nucleus	Nucleated	No nucleus
Site of production	Red bone marrow	Red bone marrow

Contrast A contrast question is set up the same way as a comparison question but focuses only on the **differences** between items.

Diagram Give a drawing, chart, plan, or graphic answer; label the diagram and add a brief description if needed.

Define Give concise and clear meanings. Do not give details, but make sure to give the limits to the definition.

Q. Define homeostasis.

A. Homeostasis is the maintenance of the internal environment within a narrow physiological range.

Describe Give a detailed account of an object, event, or sequence of events.

Q. Describe secretion of a protein.

A. A protein is made in ribosomes on the surface of the rough endoplasmic reticulum. It then moves into the lumen where it may be modified. The protein then moves through the lumen of the smooth endoplasmic reticulum to its outer face. There the protein is enclosed in a vesicle which then moves to the Golgi apparatus. The vesicle fuses with the Golgi apparatus. The protein may be modified if needed. It is then sorted and stored until ready for secretion. When it is ready for secretion the protein is enclosed in a vesicle which moves towards the cell membrane. The vesicle then fuses with the cell membrane and releases its contents outside of the cell.

Differentiate A differentiate question is the same as a contrast question.

Explain

Clarify and interpret the material. Usually this means giving reasons why.

Q. Explain why alveoli are ideally suited to their function.

A. Alveoli are ideally suited to their function of gas exchange because they are numerous and small which increases surface area; they also have thin walls and they are surrounded by a capillary network which minimizes the distance for diffusion of gases between air and blood.

Give a function

This means to give the role of something i.e. what does it **do**.

Q. Give one function of the following in protein synthesis:

a) DNA

b) mRNA

A. a) DNA provides the code for the order of amino acids in the protein

b) mRNA transfers the code from DNA in the nucleus to the cytoplasm

List

Give a series of names, ideas, or things which belong to a particular class of items; write an itemized series of concise statements.

A. List the five types of blood vessels .

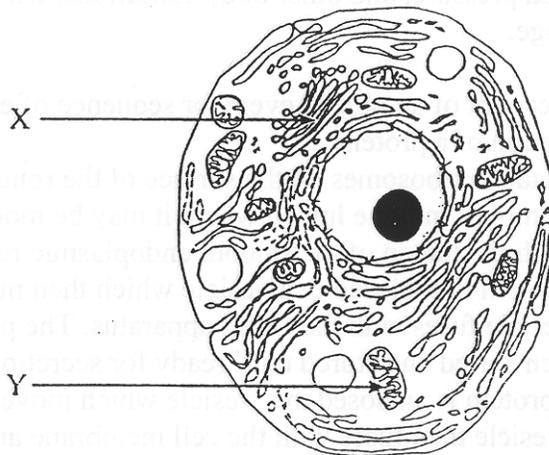
Q. The five types of blood vessels are arteries, arterioles, capillaries, venules, and veins.

Name

Identify a particular item or group of items. This is very similar to list.

If used in conjunction with a diagram it will mean identify a specific part of the diagram, usually labelled with a letter or number.

Q. Name the labelled parts.



A. X Golgi apparatus

Y Mitochondria