

SCIENCE GUIDELINES – EXPECTATIONS

BIOLOGY, GRADE 11, UNIVERSITY PREPARATION

CELLULAR FUNCTIONS

Overall Expectations

By the end of this course, students will:

- Demonstrate an understanding of cell structure and function and the process of metabolism and membrane transport;
- Investigate the fundamental molecular principles and mechanisms that govern energy-transforming activities in all living matter, whether it be animal, plant or microbial;
- Demonstrate an understanding of the relationship between cell function and their technological and environmental applications.

Relevant “Over to You” Activities:

Section 1: Read, Write and Discuss a Newspaper Report

Section 3: Research and Presentation

Section 4: Descriptive Presentation

Section 5: Online Research and Key Message Writing

Section 5: Scientific Presentation

Section 6: Research Interview

Section 7: Research

Specific Expectations

Understanding Basic Concepts

By the end of this course, students will:

- Describe how organelles and other cell components carry out various cell processes and explain how this processes are related to the function of organs;

Relevant “Over to You” Activities:

Section 3: Research and Presentation

Section 4: Descriptive Presentation

Section 5: Online Research and Key Message Writing

Section 5: Scientific Presentation

Section 6: Research Interview

Section 7: Research

Developing Skills of Inquiry and Communication

Relating Science to Technology, Society, and the Environment

By the end of this course, students will:

- Present informed opinions on advances in cellular biology, and possible applications to related technology;

Relevant “Over to You” Activities:

Section 7: Research Paper

Section 4: Role-play and Decision-Making

- Analyze ways in which societal needs have led to technological advances, related to cellular processes.

Relevant “Over to You” Activities:

Section 4: Descriptive presentation

Section 6: Research/Interview

Section 7: Research Paper

Section 10: Create a Tip Sheet

Section 10: Gather and Summarize Perspectives

INTERNAL SYSTEMS AND REGULATION

Overall Expectations

By the end of this course, students will:

- Describe and explain the major processes, mechanism and systems, including the respiratory, circulatory, and digestive systems, by which plants and animals maintain their internal environment;

Relevant “Over to You” Activities:

Section 3: Research and Presentation

- Illustrate and explain, through laboratory investigations, the contribution of various types of systems and processes to internal regulation in plant and animal systems;
- Evaluate the impact of personal lifestyle decisions on the health of human, and analyze how societal concern for maintaining human health has advanced the development of technologies related to the regulation of internal systems.

Relevant “Over to You” Activities:

Section 4: Role Play and Decision Making

Section 6: Research/ Interview

Section 10: Create a Tip Sheet

Specific Expectations

Understanding Basic Concepts

By the end of this course, students will:

- Describe the process of ventilation and gas exchange from the environment to the cell;
- Explain the role of transport of circulatory systems in the transport of substances in an organism;
- Describe the importance of nutrients and digestion in providing substances needed for energy and growth;
- Demonstrate an understanding of how fitness level is related to the efficiency of metabolism and of the cardiovascular and respiratory systems;
- Describe how the use of prescription and non-prescription drugs can disrupt or help maintain homeostatis.

Relevant “Over to You” Activities:

Section 4: Role Play and Decision Making

Developing Skills of Inquiry and Communication

By the end of this course, students will:

- Compare the anatomy of different organisms – vertebrate and/or invertebrate;
Relevant “Over to You” Activities:
Section 3: Research and Presentation
Section 7: Research
Section 7: Research Paper
- Design and carry out, in a safe accurate manner, an experiment on feedback mechanism, identifying specific variables;
- Select and integrate information about internal systems from various print and electronic sources, or from several parts of the same source.
Relevant “Over to You” Activities:
Section 3: Research and Presentation
Section 4: Descriptive Presentation

Relating Science to Technology, Society, and the Environment

By the end of this course, students will:

- Identify examples of technologies that have enhanced scientific understanding of internal systems;
Relevant “Over to You” Activities:
Section 1: Read, Write and Discuss a Newspaper Report
Section 1: Oral Presentation
Section 6: Research/ Interview
- Provide examples of Canadian contributions to the development of technology for examining internal systems;
Relevant “Over to You” Activities:
Section 1: Read, Write and Discuss a Newspaper Report
Section 1: Oral Presentation
- Analyze and explain how societal needs have led to scientific and technological developments related to internal systems;
Relevant “Over to You” Activities:
Section 1: Read, Write and Discuss a Newspaper Report
Section 1: Oral Presentation
Section 2: Make a Mini Guinness World Records Display
Section 3: Research and Presentation
Section 4: Role Play and Decision Making
- Present informed opinions about how scientific knowledge of internal systems influences personal choices concerning nutrition and lifestyle.
Relevant “Over to You” Activities:
Section 4: Role Play and Decision Making
Section 6: Research/ Interview
Section 7: Research
Section 7: Research Paper
Section 10: Gather and Summarize Perspectives
Section 10: Create a Tip Sheet