Biology 20
Course Outline

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Welcome to Biology 20!
Biology 20 is an academically rigorous course.
The major science themes developed in this course are diversity, energy, equilibrium, matter and systems. These major concepts allow connections to be drawn among the four units of this course and in Biology 30, a Diploma Examination course at the grade 12 level. It is a challenging, but richly rewarding course for students interested in Biological Sciences. There will be four major units of study involving: Energy & Matter Exchange in The Biosphere; Ecosystems & Population Change; Photosynthesis & Cellular Respiration; and Human Systems. Students should expect, and be capable of, a higher level of performance and autonomy than in Science 10.

Let's Talk About Assessment
Formative Assessment: Formative assessment is also known as assessment ***for*** learning. Essentially, this is ***feedback*** that helps both students and teachers diagnose how learning is progressing and what interventions may be needed to improve student learning. It helps students focus their priorities on areas of concern and it informs the teacher as to whether or not changes may be needed in planning lessons and activities.

Summative Assessment: Summative assessment is also known as assessment ***of*** learning. This type of assessment is done after the learning is over. It is essentially an ***autopsy***. It informs students, parents, teachers and Alberta Education how well the learning went. It is past tense. This is where the bulk of your grade, the two digits that are submitted to Alberta Education at the end of the course, comes from.

Long Range Plan

The basic learning resource of this course is the text, *Biology*, by Nelson Ltd. Other material will be developed or provided to enhance the course.

Unit A: Energy & Matter Exchange in The Biosphere - Sept. 3 – 8

General Outcome 1: *Students will* explain the constant flow of energy through the biosphere and ecosystems.

Most of the energy in the biosphere comes from the sun. Where does it all go? How is energy stored within the biosphere? What eventually happens to all the energy in the biosphere?

Nelson 2 – Energy Flow in the Biosphere

General Outcome 2: *Students will* explain the cycling of matter through the biosphere.

Energy flows and matter cycles in the biosphere. What different types of essential matter are recycled? How are they recycled?

Nelson 3 – The Cycling of Matter in the Biosphere

General Outcome 3: *Students will* explain the balance of energy and matter exchange in the biosphere, as an open system, and how this maintains equilibrium.

Have humans had an impact on our atmosphere? What is the Greenhouse Effect? What is ozone depletion? What impact has this had on ecosystems?

Nelson 1 – The Biosphere as a Closed System

Unit B: Ecosystems & Population Change Sept. 9 – Oct. 3

****Field Trip – Sept. 24****

General Outcome 1: *Students will* explain that the biosphere is composed of ecosystems, each with distinctive biotic and abiotic characteristics.

Who eats who in an ecosystem? What are trophic levels? What are pyramids of numbers, biomass and energy in an ecosystem?

Nelson 4 – Characteristics of Ecosystems

General Outcome 2: *Students will* explain the mechanisms involved in the change of populations over time.

There is a great deal of variation within populations. Why? How does the inheritance of characteristics help a population adapt to its environment? What happens to a population's characteristic over time?

Nelson 5 – Evolution

Unit C: Photosynthesis & Cellular Respiration Jan. 5-16

General Outcome 1: *Students will* relate photosynthesis to storage of energy in organic compounds.

We know we need plants to carry out photosynthesis; how do they do it? What are the inputs and outputs of photosynthesis? What steps are required to accomplish photosynthesis?

Nelson 6 – Photosynthesis

General Outcome 2: *Students will* explain the role of cellular respiration in releasing energy from organic compounds.

Humans use cellular respiration to release energy from the food we eat. How is this accomplished? What are the inputs and outputs of respiration? What steps are required to accomplish respiration?

Nelson 7 – Cellular Respiration

Unit D: Human Systems Oct. 6 – Dec. 19

General Outcome 1: *Students will* explain how the human digestive and respiratory systems exchange energy and matter with the environment.

How do we digest the food we eat? What are the chemical and physical processes involved? Which organs provide these processes?

Nelson 8 – Nutrients, Enzymes, and the Digestive System

Nelson 9 – Respiratory System and Motor System

General Outcome 2: *Students will* explain the role of the circulatory and defense systems in maintaining an internal equilibrium.

How does the circulatory system assist the digestive, excretory and respiratory systems in their exchange of energy and matter with the environment? What is blood made of? How do we fight infection?

Nelson 10 – Circulatory System

Nelson 11 – Blood and the Immune System

General Outcome 3: *Students will* explain the role of the excretory system in maintaining an internal equilibrium in humans through the exchange of energy and matter with the environment.

How does our body maintain a balanced environment for all of our cells to function? How do our kidneys work to help maintain this balance?

Nelson 12 – Excretory System

General Outcome 4: *Students will* explain the role of the motor system in the function of other body systems.

Nelson 9 – Respiratory System and Motor System

Course Review: January 14-16, 2026
Final Exam: Approximately January 22, 2026 9:00am – 12:00pm

Assessment and Evaluation

Please Note: A range of assessment information is used to determine a student's final grade. Coursework will count for 75% of the mark, the final exam will count for 25%.

Evaluation

Assignments	10%
Labs	15%
Quizzes	20%
Chapter Tests	50%
Field Study in Elkwater	5%
FINAL EXAM	25%

COURSE EXPECTATIONS:

****We are making a distraction-free learning environment. No personal mobile devices are to come to class.****

- Students are to follow all school policy and procedures in class.

1. Everybody learns differently and different rates. Try your hardest, ask for help, and I will promise you pass this course.
2. Treat your peers, this building, yourself, and your teachers with respect.
3. No putting other students down. Making derogatory remarks of any kind towards others, or any form of profanity is prohibited.
4. Bullying or any type of harassment is absolutely prohibited and will be dealt with by administration immediately.
5. Keep your class clean buy throwing your garbage away and placing recycling in the proper place (NOT the garbage!).
6. Plagiarism and cheating will not be tolerated.
7. Assignments are due at the beginning of class. **Thursdays 3:30 for TAG FLEX cut off!**
8. **Tests and quizzes must be written within a reasonable time of the class writing** and can be done during TAG or lunch.
9. **It is the student's responsibility to catch up on missed work/quizzes/tests**. TAG /Lunch detentions may be assigned for those missing critical assessment items.
10. It is the student's responsibility to follow all safety precautions and rules when performing experiments and labs.
11. Consequences for not following classroom expectations and performance in class will result in: (1) warnings, (2) detentions, (3) completion of an action plan with a phone call home, (4) Involvement of counselors and administration, and (5) a parent meeting, not necessarily in this order, depending on the seriousness of the situation.

Teacher Contact

- Students are encouraged to speak with Ms. Rief about any questions they may have. My door/email/phone is always open for you!!
- PLEASE come for help during TAG or make an appointment afterschool!
- Parents and students are encouraged to check Biology 20 through PowerSchool.