



Pre-AP Biology 20

Teacher Contact Info:

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Course Description:

The secondary science program is guided by the vision that all students, regardless of gender or cultural background, are given the opportunity to develop scientific literacy. The goal of scientific literacy is to develop in students the science-related knowledge, skills and attitudes that they need to solve problems and make decisions and, at the same time, to help students become lifelong learners who maintain their sense of wonder about the world around them.

Diverse learning experiences within the science program provide students with opportunities to explore, analyze and appreciate the interrelationships among science, technology, society and the environment and to develop understandings that will affect their personal lives, their careers and their futures.

Biology 20 consists of four units of study: Energy and Matter Exchange in the Biosphere, Ecosystems and Population Change, Photosynthesis and Cellular Respiration, and Human Systems.

Pre-AP aspect of the Biology 20 course

This course is designed to be the Pre AP® Biology 20 course that helps develop the skills, knowledge & attributes needed for students to complete AP® Biology in their grade 12 year. Students will complete their AP® Biology journey next year when they enroll into Biology 30 AP and Biology 35 during course registration.

Although most students who take AP® Biology find the course interesting, it *is extremely* challenging. You should be prepared to spend extra time outside of class everyday to keep on top of material, and develop critical thinking skills.

Laboratory or science-based activities comprise a minimum of 25% of instructional time in this course. You are also expected to put in a regularly scheduled routine of home study for this course, including completion of assigned readings, lab reports, review, and test preparation. These are requirements with which you might not be familiar, so please be prepared for the commitment that is required- in class and out.

Exams (as well as most quizzes) will be made up of both multiple choice, numeric response and written response questions. This design will familiarize you with the format of the AP® Biology exam, and provide excellent practice for you. During quizzes and exams you should conduct yourself in a manner that ensures you are completing your assessment independently. The use of notes and technological devices other than a calculator are prohibited.

Students will be assessed at the Biology 20 level and also at the AP® Biology level. What this means is that any AP® specific Tasks/Labs/Assessments will be graded and then carried forward to their Biology 35 class to be put towards that mark when they take this course in grade 12. This ensures that students will complete all the components of AP® Biology to better prepare them for their College Board AP® Biology exam during May 2025.

It is hoped that all students enrolled in the course will take the College Board AP® Biology exam in grade 12 but this is not required. The maximum grade possible on the exam is 5, and students who achieve either a grade of 4 or 5 may apply to receive credit for a first-semester biology course at their post-secondary institution. Be sure to check individual university websites for the pre-requisite AP exam scores necessary for exemption, as well as the process for submitting AP grades and requesting the credit.

Field Trip: On Nov. 23rd - 24th, Students will go to the Biogeoscience Institute at the Barrier Lake Field Station in Kananaskis. This program is hosted by the University of Calgary and allows students to use an open inquiry model to investigate processes taking place in aquatic, forest or winter ecosystems. They will be given an opportunity to explore a novel

environment and develop and test a scientific question. Students will explore local and current research and utilize scientific equipment to conduct an investigation from start to finish. Students will construct a question, conduct background research, revise their question, collect data, synthesize data and ultimately finish with a poster and/or paper outlining their research and conclusions.

More details on this trip will be forthcoming, with a parent meeting set to take place in October to give information on what will take place and how the trip will be run. It is always the highlight for every AP® Biology student in this course!

Assessment

Assessment of the following competencies and outcomes will determine a student's success in the course with a scheduled Final Exam in January. This is a tentative item as we are awaiting direction from Alberta Learning.

NMHS uses the proficiency scale (shown below) in all its science courses. Please click the link for more information.

https://school.cbe.ab.ca/School/Repository/SBAttachments/e2b087a2-787d-409a-b571-3aa591ee24fd_UnderstandingtheCBEHighSchoolProficiencyScale.pdf

Beginning		Developing		Proficient		Exemplary	
1	2	1	2	1	2	1	2
The student demonstrates a level of understanding and/or skill that is not yet meeting expectations of the course outcomes. ■ The quality of work may be vague and/or undeveloped. ■ Targeted adjustments to planning and instruction will be necessary for further learning in this area.		The student demonstrates a basic level of understanding and/or skill that meets expectations of the course outcomes. ■ The quality of work may be adequate and/or concrete. ■ Adjustments to planning and instruction may be necessary for further learning in this area.		The student demonstrates a well-developed level of understanding and/or skill that meets expectations of the course outcomes. ■ The quality of work may be clear and/or well-reasoned. ■ The student can be confident of being prepared for further learning in this area.		The student demonstrates a mastery level of understanding and/or skill that meets expectations of the course outcomes. ■ The quality of work may be perceptive and/or insightful. ■ The student can be confident of being prepared for further learning in this area.	
20%	40%	55%	65%	75%	85%	95%	100%

For a more detailed list of curricular outcomes, please see the [Biology 20 Program of Studies](#) .

Competencies

The Science department will formally assess five competencies. This does not mean the other three competencies will not have a place within Science; in fact, those competencies are a natural part of the tasks we do in Science. Assessment of these competencies will be embedded as skills outcomes.

Competency	Descriptor	Skills Outcomes
Solve Problems Think Critically	Involves selecting strategies and resources to move from what is known to what is sought. Students analyze situations, create plans of action and implement solutions	SK1, SK3
Manage Information	Involves accessing information from a variety of sources, organizing and using that information to clarify understanding and share that information effectively.	SK2, SK3
Communication Collaboration	Involves sharing ideas, clarifying the purpose, considering perspectives, interpreting ideas and expressing ideas and concepts using appropriate language, conventions or protocols. Involves working with others to achieve a common goal. Students participate to exchange ideas and share responsibilities, value the contributions of others and are willing to compromise.	SK1, SK4

Outcomes

(*The following AP concepts will be explored throughout the Biology 20 Outcomes listed below:

The Chemistry of Life, Cell Structure & Function, Cellular Energetics, Ecology and Natural Selection)

Topic	Identifier		Outcome
Energy and Matter Exchange in the Biosphere	A1	Energy Flow	Students will explain the constant flow of energy through the biosphere and ecosystems.
	A2	Cycling of Matter	Students will explain the cycling of matter through the biosphere.
	A3	Equilibrium	Students will explain the balance of energy and matter exchange in the biosphere, as an open system, and explain how this maintains equilibrium.
Ecosystems & Population Change	B1	Ecosystems	Students will explain that the biosphere is composed of ecosystems, each with distinctive biotic and abiotic characteristics.
	B2	Evolution	Students will explain the mechanisms involved in the change of populations over time.
Photosynthesis & Cellular Respiration	C1	Photosynthesis	Students will relate photosynthesis to storage of energy in organic compounds.
	C2	Cellular Respiration	Students will explain the role of cellular respiration in releasing potential energy from organic compounds.
Human Systems	D1	Digestion and Respiration	Students will explain how the human digestive and respiratory systems exchange energy and matter with the environment.
	D2	Circulatory	Students will explain the role of the circulatory and defense systems in maintaining an internal equilibrium.
	D3	Excretory	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.
	D4	Muscles	Students will explain the role of the motor system in the function of other body systems.
Skills	SK1	Initialize and Plan	Ask questions about observed relationships, and plan investigations of questions, ideas, problems and issues
	SK2	Perform and Record	Conduct investigations into relationships between and among observable variables, and use a broad range of tools and techniques to gather and record data and information
	SK3	Analyze and Interpret	Analyze data and apply mathematical and conceptual models to develop and assess possible solutions
	SK4	Communication And Teamwork	Work as members of a team in addressing problems, and apply the skills and conventions of science in communicating information and ideas and in assessing results

Course Materials and Resources:

Materials: Binder with loose-leaf paper, pens, pencils, erasers, ruler, calculator.

Textbook:
 Option 1: Nelson: Biology 20/30
 Option 2: Campbell Biology AP Edition
 Option 3: McGraw-Hill – Inquiry into Biology

- Digital versions are available on D2L



ONLINE Resources: All class material (notes, assignments, labs, projects) will be posted on D2L weekly. Students should check the D2L shell regularly. If class is missed, students are expected to make up missed work on D2L or with teacher as soon as possible. The textbook resources (pages, multimedia, videos, etc.) will be available on D2L for students.

EXPECTATIONS: It is the student's responsibility to determine what was done in a class for which they were absent. Students are expected to take responsibility for their own learning. Extra help is provided during posted tutorial times.

1. If a student is to be absent for a scheduled assessment, parents MUST contact Mr. Skeith PRIOR to the assessment. The missed assessment will be completed at 7:30am on a selected Friday. Students who do not complete a formal assessment will be given a BG2 in PowerSchool. Frequent absences during assessment periods will result in administration intervention.
2. Assigned homework and assignments should be completed and placed in the appropriate bin or submitted online (D2L) by the due date. Due dates should be strictly adhered to due to the nature and quantity of science work.

LABS:

- All students will be required to submit a signed Lab Safety contract prior to participating in physical labs.
- All students must have appropriate footwear and goggles for every lab. Failure to have these items will result in the student not participating in the lab.
- See Course Agreement for information on missed labs.
- Lab work will be a combination of AP labs, and labs adapted from other sources. Our lab work will involve discussing issues with classmates and answering questions to facilitate your exploration and deepen your understanding of the concepts. You will be required to write up several formal lab reports in the format which has been included in this course outline. To emphasize the approach of biology as a process, hands-on labs and activities stress the collection and analysis of data, as well as a clear discussion of results.

How to get help and ask questions in Biology 20:

- In person science content help: during tutorial times Rm 1169
 - Mon & Weds 3:30-4:00pm
- General questions about course content and assessment: Email or use Private Discussions on D2L
- Email: jtskeith@cbe.ab.ca

Key Links:

- ◆ NMHS [Code of Conduct](#), [Digital Citizenship](#), [Academic Integrity](#), [Assessment Rules](#)
- ◆ [Competency Descriptions & indicators \(Alberta Education\)](#)

Biology 20 Expectations and Assessment Agreement:

As Biology 20 is a pre-requisite for a diploma level course with an exam set up and run by the Alberta Government, students are expected to complete all aspects of the course in order to be successful on the Biology 30 diploma exam. Class work, Labs, and Assessments are all expected to be completed on scheduled days at times set by your student's teacher.

In the event of your student missing a Formal Assessment:

Makeup Outcome Tests will be given without penalty ONLY in the event of an excused absence when the **instructor has been notified by a parent before the evaluation** is given.

Documentation (e.g., notification via email to the teacher) must be provided before the class in which the evaluation is administered. Unexcused absences from quizzes will result in the student receiving a BG2 on the missed Assessment. All missed Outcome Tests for this semester will be made up on select Friday mornings at 7:30 am scheduled by Mr. Skeith.

In the event of your student missing a Lab:

Labs are an important part of Science classes, where your student demonstrates the skills and behaviours required to put class learning to practical use. The CBE has set Labs and Lab Skills at 20% of your student's Biology 20 in-class grade. Missed Labs will NOT be able to be set up again so it is important that your student attend Lab Days in order to properly demonstrate the required Lab Skills. Each student will be allowed ONE excused absence for Biology 20 Labs. Should your student miss any other labs, their teacher will enter in a failing grade for that Lab, unless your teacher chooses to schedule an alternate assessment day with you. The accommodations granted in such cases will be determined on a case-by-case basis and are also determined by the type of Lab and whether alternative assessments are capable of being made.

Please complete the following:

- ☐ YES I have read and understand the Assessment and Lab Policy stated above
- ☐ YES I have read and understand the Biology 20 Course Outline and all relevant attachments (Proficiency scale, program of studies and outcome based assessment)
- ☐ YES I am aware of the Course Material and information available on the D2L Shell

Parent Signature _____.

Parent Name _____

Best method of Communication: Please list phone number or email: _____

AP Biology Formal Lab Report Guidelines

Prepare a written report of your experiment which includes the section titles listed below. These section titles should be used to label each section of your report.

- I. Title*
- II. Introduction*
- III. Materials and Procedures*
- IV. Results/Data Collection/Analysis*
- V. Discussion/Conclusion*
- VI. References*
- VII. Questions*

The following information should be included in each section of the lab report.

- I. **Title** - Be as specific as possible and briefly denote primary topic dealt with during the experimentation. The title should be written in the appropriate box provided on the lab book formatted page.
- II. **Introduction** - In this section of the report you should include the following pieces of information:
 - a. Background information that will help them understand the experiment that you have conducted. Important terms should be defined in the section.
 - b. Purpose of the lab and should be clearly stated in the introduction.
 - c. Hypothesis – a testable hypothesis should be included, written in an **if-then-because** format.
- III. **Materials & Procedures** - A complete listing of the materials and supplies that were used to conduct the experiment should be included in this portion of the report. In this section of the report you should present the exact steps that were followed in your experiment. Clearly identify the control, manipulated and responding variables and the measurement techniques used.
- IV. **Results/Data Collection/Analysis** - All of the data that was collected during the experiment should be presented in a data table or tables. Additionally, a graph of the data should be included in this section (if appropriate). Make sure that the graph is appropriately titled and axes labeled with units. Include a legend if necessary.
- V. **Discussion/Conclusions** - This portion of the report is used to clearly explain whether the results support or refute the hypothesis being tested. Explain what your findings mean and what conclusions you can draw from the data. Sources of error and suggestions for improvement should be included in this section.
- VI. **References** – Given that some of the information included in your lab write up will have been taken from a published lab activity, you should include a citation of the source using APA 7th edition format. The source(s) used should be cited within your lab write-up (especially in the introduction section) using APA in-text citation. Example: (College Board, 2001).

The following citation format will be appropriate for lab reports based on one of the 12 AP Biology labs:

Lab # _____ Title of Lab (College Board, 2001) for in-text citations

AP® Biology Lab Manual for Students (2001) New Jersey: College Board. p. ____ - _____. for your reference list at the end of the lab/

- VII. **Questions** – The discussion questions found throughout the laboratory should be *written and answered* in this section.