Mr. Schmitt Okanagan Mission Secondary – Science Dept.

# **Life Sciences 11: Course Outline**

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Welcome to Life Sciences 11! This course can be fun and interesting, which will expand your mind and heighten your awareness of the world around you. In this course, we will be examining various aspects of the living organisms around us – from gymnosperms to streptococci to nematodes! Get ready to take an exciting journey into the intricacies of your environment! Please see my website to view notes, assignments and homework as well as an overview for the year.

**Evaluation**

There are approximately 6 major tests for this course, which come really quickly during the semester system. If you miss a test or a quiz, YOU are responsible to make it up. YOU must contact me and we will set up an appropriate time. Missed tests/quizzes without a parent-excused absence will result in a score of zero.

 I do not allow students to re-take quizzes; however, I will omit the quiz mark if the student proves to me that they understand the material in the unit/chapter test. Students can re-do major assignments if I have granted prior approval.

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| A = 86% - 100% B = 73% - 85.9% C+ = 67% - 72.9%C = 60% - 66.9%C - = 50% - 59.9%I = Below 49.9% |

 **Mark Distribution:**

Term Mark: 80%

Final Exam: 20%

FINAL mark 100%

**Term Mark:**

75% = Tests and Quizzes

 + 25% = Labs and Assignments

 100%

**Final Exam**

There will be a final exam worth 20% of you mark at the end of the course which will include the 5 major units that we will be covering: (1) Cells & Cell Processes (and Scientific Method), (2) Adaptation & Evolution, (3) Microbiology, (4) Plant Biology, (5) Animal Biology. It is possible to omit previous test marks if students demonstrate sufficient evidence of improvement on the final exam. There may be some class time to study for the final exam if we, as a class, can get through the material in an efficient timeline.

**Materials**

* Three ring binder
* Lined and blank paper
* Pencils, ruler, eraser
* Whiteboard markers
* Coloured pens and pencils
* Flashcards (recommended)

**Classroom Expectations:**

1. Based on **mutual respect**.
* Being respectful of your fellow classmates and teacher goes a long way in ensuring that this will be a productive and enjoyable class.
	+ - Please listen when others are talking and raise your hand to provide answers and ask questions.
		- Criticism should focus on the ideas not the person.
* Use class time effectively. Behavior in the classroom should reflect a serious and responsible attitude where the student strives to reach their full potential. Time given to work on assignments in class must be used effectively. **Socializing and inappropriate behavior will not be tolerated.**
* Respect the classroom by removing all garbage and recyclables.
1. **Safety** – based on **mutual respect**.
* If you are sick, consider staying home or at the minimum, wear a mask in class. Wearing a mask helps to protect OTHERS in the room, not only you.
* Follow all lab safety rules. If you are unable to be safe amongst your classmates, you will be given alternate written assignments.
1. **Show up to class prepared and on time.** This means you have your binder, homework, textbook, pens, pencils etc. ready to go at the **start of class**.
2. **Respect lab equipment** and **class supplies** such as whiteboard markers or other shared materials and **clean up after yourself** when you are finished with them.
3. **Food** **and drinks** should be saved for break time.
4. **Cell phones** are not permitted during class time **unless requested by the teacher.**

**Strategies for Success**

 Life Sciences 11 is a content driven course that requires you to spend time learning the material. Show up on time + Work hard while you are here + Review at home = Success.

**Class Syllabus**

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| **Class Topic** | **Reading (pages)** |
| Intro, Scientific Method, Characteristics of Life | Ch. 1 – 1, 2, 3 |
| Chemicals of Life, Cells | Ch. 2 – 3 |
| Evolution: History | Ch. 17 – 2; 15 – 1 |
| Evolution: Lamarck and Darwin | Ch. 15 – 2, 3 |
| Evolution: Natural Selection | Ch. 15 – 3 |
| Evolution: Speciation | Ch. 16 – 3 |
| Evolution: Evidence of Evolution | Ch. 16 – 1 |
| Evolution: Evidence Continued | Ch. 17 – 1 |
| Evolution: Human Evolution | Ch. 32 – 3 |
| Evolution: Origin of Life | Ch. 17 – 2, 3, 4 |
| Taxonomy and Viruses | Ch. 18; Ch. 19 – 2,3 |
| Domain Archabacteria and Eubacteria | Ch. 19 – 1 |
| Plants: Algae and Bryophytes | Ch. 20 – 3,4; Ch. 22 - 2 |
| Plants: Ferns and Conifers | Ch. 22 – 3,4; 24 |
| Plants: Angiosperms | Ch. 22 – 5; Ch. 23 |
| Phylum Porifera and Cnidaria | Ch. 26 |
| Phylum Platyhelminthes | Ch. 27 – 1 |
| Phylum Nematoda | Ch. 27 – 2 |
| Phylum Annelida | Ch. 27 – 3 |
| Phylum Mollusca | Ch. 27 – 4 |
| Phylum Arthropoda | Ch. 28 – 1, 2, 3 |
| Phylum Echinodermata | Ch. 28 – 4 |
| Lower Vertebrates and Fish | Ch. 30 -1, 2 |
| Amphibians and Reptiles  | Ch. 30 – 3; Ch. 31 - 1 |
| Birds and Mammals | Ch. 31 – 2; Ch. 32 – 1, 2 |
| FINAL EXAM |  |

**Course Outcomes:**

Please use the following as a checklist at the end of each unit before you write the test.

**Cells and Cell Processes (and Scientific Method)**

1. Compare prokaryotic vs eukaryotic cells

2. Identify the roles of each organelle in the cell

3. Explain how a protein is made

4. Explain how and why mitosis and meiosis occur

5. Explain diffusion and osmosis and the conditions for the movement of water

6. Compare the four different classes of biological molecules

**Adaptation and Evolution:**

1. Describe the basic structure of DNA

2. Identify the roles of DNA in evolution

3. Explain the role of sexual reproduction in variation and evolution

4. Describe the process of natural selection

5. Suggest conditions under which allelic frequencies of a population could change, including genetic drift, differential migration, mutation, and natural selection

6. Differentiate among and give examples of convergence, divergence and speciation

7. Compare and contrast the gradual change model with the punctuated equilibrium model of evolution

8. Identify the role of extinction in evolution

**Microbiology (Viruses)**

9. Describe the basic structure of a virus

10. Evaluate the evidence used to classify viruses as living or non-living

11. Compare and contrast the lytic and lysogenic cycles

12. Describe the body’s basic lines of defense against a viral attack

13. Give examples of ways to reduce the chance of contracting a viral disease

14. Define and give examples of viral specificity

15. Evaluate the effects of virulence on human health

**Microbiology (Domain Archaebacteria and Eubacteria)**

16. Describe the basic structure of a prokaryotic cell

17. Examine members of the Kingdom Monera and describe characteristics that unify them

18. Use examples to illustrate moneran diversity with respect to the following: form, distribution, motility, ecological role, nutrition and human disease

19. Differentiate among fermentation, aerobic respiration and photosynthesis in monerans

20. Contrast the ways in which bacterial decomposers and parasites obtain their food

21. Demonstrate the correct use of a compound microscope

22. Evaluate the effectiveness of various antibiotics and antiseptics on bacterial cultures

23. Explain processes by which bacteria adapt to become resistant to antibiotics

24. Give examples of the beneficial roles of bacteria

**Plant Biology (Green Algae, Mosses and Ferns)**

25. Examine green algae, mosses and ferns and describe characteristics that unify them

26. Demonstrate the correct use of the dissection microscope

27. Explain the benefits of alternation of generations

28. Use examples of unicellular, colonial and multicellular green algae to illustrate their diversity

29. Describe the ecological roles of green algae, mosses and ferns

30. Describe the role of mosses as pioneer plants

31. Compare and contrast how ferns and mosses have adapted to a land environment

**Plant Biology (Gymnosperms)**

32. Describe the characteristics that unify gymnosperms

33. Explain how gymnosperms are adapted for survival in a land environment with respect

to the following: alternation of generations, needles, seeds, pollen and vascular tissue

34. Explain the role of meristems in primary and secondary stem growth

35. Evaluate the economic and ecological importance of gymnosperms

**Plant Biology (Angiosperms)**

36. Examine angiosperms and describe characteristics that unify them

37. Examine members of the Phylum Porifera and Phylum Cnidaria and describe characteristics that unify them

38. Compare and contrast the ways in which angiosperms and gymnosperms have adapted to a land environment

39. Use specimens to differentiate between monocots and dicots

**Animal Biology (Porifera, Cnidaria)**

40. Explain the process of filter feeding in a sponge

41. Demonstrate knowledge of the ecological roles of sponges and cnidarians

42. Compare and contrast polyp and medusa with respect to structure, general function and motility

43. Suggest the advantages of a motile form in the life cycle of a cnidarian

44. Explain the evolutionary significance of multicellular (cnidarian) versus colonial (poriferan) life forms

**Animal Biology (Platyhelminthes, Nematoda, Annelida)**

45. Explain members of the Phylum Platyhelminthes, Phylum Nematoda and Phylum Annelida and describe characteristics that unify each

46. Demonstrate safe and correct dissection techniques

47. Contrast the structural features of platyhelminths, nematodes and annelids

48. Examine and explain physical changes that were necessary for flatworm to become parasitic

49. Demonstrate knowledge of the ecological roles of the platyhelminths, nematodes and annelids

50. Evaluate the characteristics of a successful parasite

51. Compare platyhelminths, nematodes and annelids with respect to evolutionary changes

52. Demonstrate knowledge of human disorders that are caused by nonsegmented nematodes

**Animal Biology (Mollusca, Echinodermata)**

53. Examine members of the Phylum Mollusca and Phylum Echinodermata and describe characteristics that unify them

54. Compare and contrast members of two or more classes of molluscs

55. Demonstrate a knowledge of the adaptations of molluscs and echinoderms

56. Demonstrate a knowledge of the diverse ecological roles of molluscs and echinoderms

**Animal Biology (Arthropoda)**

57. Examine members of the Phylum Arthropoda and describe characteristics that unify them

58. Contrast members of two or more classes of arthropods

59. Demonstrate a knowledge of the adaptations of arthropods to a terrestrial environment

60. Demonstrate an appreciation of the diverse ecological and economic importance of arthropods

**Animal Biology (Chordata - Subphylum Vertebrata)**

61. Examine members of vertebrates and describe characteristics that unify them

62. Contrast members of two or more classes of vertebrate

63. Contrast the structure and function of the exoskeleton to the endoskeleton

64. Demonstrate knowledge of the diverse ecological role of vertebrates

**All Things Are Difficult Before They Are Easy**