

Textbook: Biology by Solomon, Berg and Martin, 6th Edition, Coles/Brook

Lab manual: The AP Biology Lab Manual for Students, E Edition College Board

PHILOSOPHY

A student in my Advanced Placement Biology class is expected to demonstrate specific scientific cognitive and knowledge skills. My objective is to help students to become self-motivated, independent learners and critical thinkers. I also strive to expose students to a variety of learning contexts and styles. I assign a variety of hands-on projects, internet activities as well as more traditional activities. Students use the internet to conduct research, to do lab simulations and other types of activities. I have seen the growing influence of Molecular Biology, and the internet in my instructional strategies. My students are increasingly using the internet to improve and display their knowledge. Students need to understand that in contemporary Biology, critical thinking, statistical analysis, computers and the internet are vital for research as was evident in the Human Genome Project.

INSTRUCTIONAL STRATEGIES.

1. The eight major themes, as stated in the AP Biology Course description, are stressed: *Science as Process; Evolution; Energy Transfer; Continuity and Change; Relationship of structure to function; Regulation; Interdependence in nature; Science, technology, and society.*
2. My focus is on cooperative learning. Students are given the opportunities to work with a number of instructional tools, e.g. Internet-connected PCs and laptops, posters, 3-D models, digital cameras. They work in group size ranging from 2-5, depending on the instructions. Working in groups, they are given numerous opportunities for hands-on, enactive activities. In addition, I have incorporated critical thinking as a vital component of my instructional strategy.
3. Students are given a number of multimedia projects throughout the year as they tend to be very enthusiastic about these. Their presentations typically include power point presentation and flash animations.
4. I have included weekly review of scientific articles for a thrust on literacy.
5. Students are evaluated on a weekly basis in a variety of formats e.g. multiple choice and short answers. I have included a variety of critical thinking questions in these evaluations. There is a major examination at six times per year, corresponding to their marking periods.

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6. Students are given homework on each chapter of the textbook completed. There are three types of chapter reviews which are utilized regularly as homework: a. Evolution Connection b. The Process of Science, and c. Science, Technology and Society.

7. Twelve laboratory activities, as stated in the Course descriptions, are given throughout the year. Students are expected to write a formal laboratory report for each lab.

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Theme: Molecules and Cells

Unit The Organization of Life

Chapter 1. Overview of Life and the Scientific Method

Chapter 2. Atoms and Molecules, Including the Properties of Water

Chapter 3. The Chemistry of Life (Organic Molecules)

Chapter 4. Organization of the Cell

Chapter 5. Biological Membranes

Unit Energy Transfer

Chapter 6. Energy and Metabolism

Chapter 7. Cellular Respiration

Chapter 8. Photosynthesis

Theme: Heredity and Evolution

Unit The Continuity of Life: Genetics

Chapter 9. Chromosomes, Mitosis and Meiosis

Chapter 10. Basic Principles of Heredity

Chapter 11. DNA: the Carrier of Genetic Information

Chapter 12. RNA and Protein Synthesis

Chapter 13. The Control of Gene Expression

Chapter 14. Genetic Engineering

Chapter 15. The Human Genome

Chapter 16. Genes and Development

Unit The Continuity of Life: Evolution

Chapter 17. Introduction to Darwinian Evolution

Chapter 18. Evolutionary Change in Populations

Chapter 19. Speciation and Macroevolution

Chapter 20. The Origin and Evolutionary of Life

Theme: Organisms and Populations

Unit The Diversity of Life

Chapter 22: Systematics

Chapter 23. Viruses and Bacteria

Chapter 24. The Protists

Chapter 25. Kingdom Fungi

Unit Structure and Life Processes in Plants

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Chapter 26. The Plant Kingdom: Seedless Plants

Chapter 27. The Plant Kingdom: Seed Plants

Chapter 31. Plant Structure, Growth and Differentiation

Chapter 32. Leaf Structure and Function

Chapter 33. Stems and Plant Transport

Chapter 34. Roots and Mineral Nutrition

Chapter 35. Reproduction in Flowering Plants

Chapter 36. Growth Responses and Regulation of Growth

Unit Structure and Life Processes in Animals

Chapter 28. The Animal Kingdom: Animal Diversity

Chapter 29. The Animal Kingdom: Protostomes

Chapter 30. The Animal Kingdom: Deuterostomes

Chapter 37. The Animal Body

Chapter 38. Skin, Skeleton and Muscle

Chapter 39. Neural Signaling

Chapter 40. Neural Regulation

Chapter 41. Sensory Reception

Chapter 47. Endocrine Regulation

Chapter 42. Internal Transport: Circulation

Chapter 44. Gas Exchange

Chapter 45. Digestion and Nutrition

Chapter 46. Excretion and the Kidney

Chapter 43. Internal Defense: Immune System

Chapter 48. Reproduction

Chapter 49. Animal Development

Chapter 50. Animal Behavior

Theme: Interdependence in Nature

Unit Interactions of Life: Ecology

Chapter 51. Population Ecology

Chapter 52. Community Ecology

Chapter 53. Ecosystems and the Biosphere

Chapter 54. Ecology and the Geography of Life

Chapter 55. Humans in the Environment

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LAB SCHEDULE

1. Lab#1: Diffusion and Osmosis
2. Lab#2: Enzyme catalysis
3. Lab#3: Meiosis and Mitosis
4. Lab#4: Plant Pigment and Photosynthesis
5. Lab#5: Cell respiration
6. Lab#6A: Transformation
7. Lab6B: Electrophoresis
8. Lab#7: Genetics of Organisms, Chi-squared
9. Lab#8: Population Genetics and Evolution
10. Lab#9: Transpiration
11. Lab#10: Physiology of the Circulatory system
12. Lab#11: Animal Behavior
13. Lab#12: Dissolved Oxygen and aquatic Primary Productivity

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DURATION	THEME	UNIT	CHAPTER	MAIN ACTIVITIES
14 days	MOLECULES AND CELLS Part 1	The Organization of Life		
			1. Introduction: Overview of life	
			2. Atoms and molecules	Properties of water foldable
			3. Chemistry of Life (Organic)	Organic Compounds Fold out book
			4. Organization of the Cell	Cell Analogy Project
			5. Biological membranes	Lab 1- DIFFUSION AND OSMOSIS
5 days	MOLECULES AND CELLS Part 2	Energy Transfer	6. Energy and Metabolism	Lab 2: Enzyme Catalysis
			7. Cellular Respiration	Lab 5: Cell Respiration
			8. Photosynthesis	Lab 4: Plant Pigment and Photosynthesis
6 WEEKS	HEREDITY AND EVOLUTION	The Continuity of Life: Genetics	9. Chromosomes, Mitosis & Meiosis	Mitosis Flip Book Lab 3: Mitosis and Meiosis
			10. Basic Principles of Heredity	Genetic Problems

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			11. DNA: The Carrier of	www.DNAi DNA Model
			12. RNA & Protein Synthesis	Lab 7: Genetics of Organisms

DURATION	THEME	UNIT	CHAPTER	MAIN ACTIVITIES
	HEREDITY AND EVOLUTION	The Continuity of Life: Evolution	13. The Control of Gene Expression	Lab 6A: Transformation
			14. Genetic Engineering	
			15. The Human Genome	
			16. Genes and Development	
			17. Introduction to Darwinian Evolution	
			18. Evolutionary Change in Populations	Lab 8: Population Genetics and Evolution
			19. Speciation and Microevolution	
			20. Origin and Evolutionary History of Earth	
1 WEEK	ORGANISMS AND POPULATIONS	The Diversity of Life	22. Systematics	
			23 Viruses and Bacteria	Wanted Poster
			24 The Protists	

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			25 Kingdom Fungi	
4 WEEKS	ORGANISMS AND POPULATIONS	Structure and Life Processes in Plants	26 The Plant Kingdom: Seedless Plants	
			27 The Plant Kingdom: Seed Plants	
			31. Plant Structure, Growth and Differentiation	
			32 Leaf Structure and Function	Lab 9: Transpiration
DURATION	THEME	UNIT	CHAPTER	ACTIVITIES
	ORGANISMS AND POPULATIONS	Structure and Life Processes in Plants	33 Stems and Plant Transport	
			34 Roots and Mineral Nutrition	
			35 Reproduction in Flowering Plants	Seed growth
			36 Growth Responses and Regulation of Growth	
	ORGANISMS AND POPULATIONS	Structure and Life Processes in Animals	28 The Animal Kingdom: An Introduction to Animal Diversity	
			29 The Animal Kingdom: The Protostomes	
			30 The Animal Kingdom: The Deuterostomes	Phyla Lab Practical

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			37 The Animal Body: Introduction to Structure and Function	
			38 Protection, Support, and Movement: Skin, Skeleton, and Muscle	
			39 Neural Signaling	
			40 Neural Regulation	
			41 Sensory Reception	
			42 Internal Transport	
	ORGANISMS AND POPULATIONS	Structure and Life Processes in Animals	43 Internal Defense	
			44 Gas Exchange	Lab 10: Physiology of the Circulatory System
			45 Processing Food and Nutrition	
			46 Osmoregulation and Disposal of Metabolic Wastes	
			47 Endocrine Regulation	
			48 Reproduction	

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			49 Animal Development	Animal Behavior Book
			50 Animal Behavior	Lab 11: Animal Behavior
2 WEEKS	INTERDEPENDENCE IN NATURE	Interactions of Life: Ecology	51 Population Ecology	
			52 Community Ecology	
			53 Ecosystems and the Biosphere	Lab 12: Dissolved Oxygen and Primary Productivity
			54 Ecology and the Geography of Life	
			55 Humans in the Environment	