

MANHATTAN COMPREHENSIVE NIGHT AND DAY HIGH SCHOOL
LIVING ENVIRONMENT
Curriculum Outline

Course Description: Living Environment is a comprehensive, two-semester, introductory biology course that includes a laboratory component. The course is designed to prepare students for the Living Environment Regents Exam. To be eligible to take the Living Environment Regents Exam, a student must complete all laboratory activities to the satisfaction of their teacher, with a complete set of each student's finished labs kept on file, as mandated by the State Board of Regents.

Textbook Chapters listed are from:

The Living Environment Biology
Rick Hallman
Amsco School Publications, Inc. 2000.

AND

Reviewing The Living Environment Biology
With Sample Examinations
Rick Hallman
Amsco School Publications, Inc. 2001.

Homework: Homework will be assigned daily and be checked for class credit. If a student must miss class, they should read and complete the questions at the end of the chapter assigned, for the time missed, as indicated in the curriculum outline that follows.

Grading: Tests and/or quizzes will be given on an almost weekly basis. Grades will be based on a student's test/quiz average, homework, laboratory work, and active participation in class. Report card grades will be issued at the end of each Cycle.

LIVING ENVIRONMENT 1 (first semester of a two-semester course)

- **The bullets under each week's topic heading roughly correspond to each of the four days of the week that the class meets (Mon. – Thurs.).**

Week One Topic: Biology: Scientific Inquiry & Skills

- What is Science? What is Biology?
- How Scientists Work/Experimental Design
- Studying Life/Characteristics of Living Things
- Tools and Procedures

Week Two Topic: Safety Lab, Microscope Lab

Week Four Topic: Organic Chemistry

(Chapter 5 From Atoms to Cells)

- Atoms, Elements / Chemical Compounds, Chemical Bonds
- Carbon Compounds: Carbohydrates & Lipids
- Carbon Compounds: Nucleic Acids
- Cell Theory / Levels of Organization

Week Five Topic: Introduction to Ecology

(Chapter 24 An Introduction to Ecology)

- What is Ecology? / Levels of Organization
- Adaptations and Evolution
- Habitat & Niche/ Environmental Limiting Factors
- Aquatic Ecosystems/Terrestrial Ecosystems

Week Six Topic: Population and Community Ecology

(Chapter 25 Populations and Communities)

- Populations and Communities
- Population Growth/ Carrying Capacity
- Community Interactions/ Symbiotic Relationships
- Changing Communities/ Ecological Succession

Week Seven Topic: Ecosystems

(Chapter 26 Ecosystems)

- Ecosystem Characteristics/Energy Flow through Ecosystems
- Food Chains and Food Webs/The Energy Pyramid
- Recycling of Materials in Ecosystems/Importance of Biodiversity
- Biodiversity & Ecosystem Stability/Effects of Loss of Biodiversity, Preservation of Biodiversity

Week Eight Topic: Humans and the Environment

(Chapter 27 People and the Environment)

- The Changing Landscape/The Effect of Humans on the Environment
- Changes to the Land & Water
- Changes to the Air: Global Climate Change, Acid Rain, Ozone Depletion
- Human Population Growth

Week Nine Topic: Sustainable Development

(Chapter 28 Saving the Biosphere)

- Renewable and Nonrenewable Resources
- Conserving Natural Resources: Attitudes and Behavior
- Sustainable Development/Sustainable Forestry
- Environmental Protection in Developing and Developed Countries

Week Ten Topic: The Cell & Chemical Activities

(Chapter 6 Chemical Activity in the Cell)

- The Cell Membrane/ Transport across the Cell Membrane
- Passive Transport (Diffusion & Osmosis)/ Active Transport
- Enzymes/ Factors that Effect of the Rate of Enzyme Activity
- Cell Organelles

- END OF CYCLE 1 -

Week Eleven Topic: Diffusion Lab

Week Twelve Topic: Photosynthesis

(Chapter 7 The Flow of Energy: Photosynthesis and Respiration)

- Autotrophs and Heterotrophs / Inorganic and Organic Compounds
- Chloroplasts and Photosynthesis
- Leaf Structure and Photosynthesis
- Light and Pigments/Factors that Effect the Rate of Photosynthesis

Week Thirteen Topic: Respiration

(Chapter 7 The Flow of Energy: Photosynthesis and Respiration)

- Chemical Energy and Food/ Overview of Cellular Respiration
- Anaerobic Respiration: Glycolysis & Fermentation
- The Mitochondria and Aerobic Respiration
- Energy and Exercise/ Comparing Photosynthesis and Cellular Respiration

Week Fourteen Topic: Nutrition

(Chapter 8 Getting Food to Cells: Nutrition)

- Steps in Nutrition /The Need for Digestion
- Organic and Inorganic Nutrients/ Mechanical and Chemical Digestion
- The Human Digestive System/ Alimentary Canal and Accessory Structures
- Absorption of Nutrients/Diseases of the Digestive System

Week Fifteen Topic: Gas Exchange/Respiratory System

(Chapter 9 Matter on the Move: Gas Exchange and Transport)

- Breathing and Cellular Respiration/Gas Exchange Surfaces
- The Human Respiratory System/ Diffusion of the Respiratory Gases
- Breathing: Moving Air/Lungs, Diaphragm, The Bell Jar
- Diseases of the Respiratory System

Week Sixteen Topic: Transport System

(Chapter 9 Matter on the Move: Gas Exchange and Transport)

- The Heart, Blood Vessels/ Oxygenated versus Deoxygenated Blood
- Blood Flow: Components of the Blood/ The Lymphatic System
- ICF/The Lymphatic System
- Cardiovascular Disease

Week Seventeen Topic: Homeostasis

(Chapter 10 The Need for Homeostasis)

- Homeostasis in Unicellular versus Multicellular Organisms
- Cells, Capillaries, and ICF
- Maintaining Homeostasis when we Exercise / Feedback Mechanisms
- Homeostasis in Plants/ Role of Organ Systems in Maintaining Homeostasis

Week Eighteen Topic: Making Connections Lab**Week Nineteen Topic: Regulation: Nervous System**

(Chapter 11 Integration and Control: Nervous and Hormonal Regulation)

- Communication Between Cells
- The Nerve Cell/ From Stimulus to Impulse
- The Human Nervous System/ Central Nervous System versus Peripheral Nervous System
- Diseases that Affect the Nervous System

Week Twenty Topic: Regulation: Endocrine System

(Chapter 11 Integration and Control: Nervous and Hormonal Regulation)

- Endocrine Glands & Hormones
- Receptor Molecules, Target & Non-target Cells
- The Human Endocrine System
- Diabetes: A Disease of the Endocrine System

- END OF CYCLE 2/END OF LIVING ENVIRONMENT 1 -

LIVING ENVIRONMENT 2 (second semester of a two-semester course)**Week One Topic: Excretion**

(Chapter 13 Excretion and Water Balance)

- The Human Excretory System
- The Kidneys/Filtration & Reabsorption
- Perspiration/Homeostasis and the Liver
- Diseases of the Excretory System

Week Two Topic: Immunity

(Chapter 14 Disease and Immunity, Wellness and Fitness)

- Disease/Factors that Cause Disease
- The Human Immune System/Vaccinations
- White Blood Cells/ Antigens& Antibodies
- AIDS and other Diseases of the Immune System

Week Three Topic: Mitosis

(Chapter 15 How Cells Divide)

- The Cell Cycle/The Roles of Mitosis
- The Process of Cell Division
- Mitosis as Asexual Reproduction/Types of Asexual Reproduction
- Rate of Cell Division/Cancer

Week Four Topic: Meiosis and Fertilization

(Chapter 16 Meiosis and Sexual Reproduction)

- Gametes versus Body Cells/ Meiosis: Reduction Division
- Meiosis as a source of Genetic Variation
- Sexual Reproduction in Plants/ External versus Internal Sexual Reproduction
- External Development: The Structure of the Egg

Week Five Topic: Human Reproduction

(Chapter 17 Human Reproduction)

- The Male Reproductive System
- The Female Reproductive System
- The Role of Hormones in Sexual Reproduction
- The Menstrual Cycle

Week Six Topic: Growth and Development

(Chapter 18 Growth and Development)

- Embryonic Development
- Structures Involved in Internal Development
- Growth & Differentiation of Cells
- Dangers to the Fetus

Week Seven Topic: DNA

(Chapter 19 DNA Structure and Function)

- The Role of the Genetic Material
- DNA Structure: The Double Helix
- DNA Replication
- Mutation

Week Eight Topic: Protein Synthesis

(Chapter 20 Genes and Gene Action)

- From DNA to RNA
- From RNA to Protein
- The Effect of Mutation in Protein Synthesis
- Gene Expression and Cell Differentiation

Week Nine Topic: Gene Expression

(Chapter 21 Patterns of Inheritance)

- Gregor Mendel/The Laws of Inheritance
- The Role of Alleles in Inheritance
- Environmental Effects on Gene Expression
- Selective Breeding of Plants and Animals

Week Ten Topic: Human Genetics

(Chapter 22 Human Genetics)

- END OF CYCLE 3 -

Week Eleven Topic: Biodiversity Lab

Week Twelve Topic: Biotechnology

(Chapter 23 Biotechnology)

Week Thirteen Topic: Introduction to Organic Evolution

(Chapter 1 The Process of Evolution)

Week Fourteen Topic:

(Chapter 2 Evidence of Evolution)

Week Fifteen Topic:

(Chapter 3 The Origin and Extinction of Species)

Week Sixteen Topic: Beaks of Finches Lab

Week Seventeen Topic: Living Environment 1 Review

Week Eighteen Topic: Living Environment 2 Review

Week Nineteen Topic: Preparation for the Living Environment Regents Exam

- END OF CYCLE 4/ END OF LIVING ENVIRONMENT 2 -