apologia

EXPLORING CREATION WITH

BIOLOGY

3rd EDITION

COURSE INTRODUCTION

MODULE 1: THE SCIENCE OF LIFE

MODULE 2: THE CHEMISTRY OF LIFE

MODULE 3: THE FIRST FOUR KINGDOMS

MODULE 4: CELL STRUCTURE AND FUNCTION

Organelles of Eukaryotic Cells (47:41)
Cell Wall
The Nucleus
The Endoplasmic Reticulum
The Golgi Apparatus
Vacuoles and Vesicles
The Lysosome
The Peroxisome
The Mitochondrion
The Plastids
The Cytoskeleton
Centrioles
Experiment 4.1: Plant and Animal Cell Structure
A Closer Look at Membranes (07:54)
Movement Through Membranes (21:16)
Passive Transport: Diffusion
Passive Transport: Osmosis
Experiment 4.2: Osmosis in Animal Cells
Osmosis in Living Cells (22:07)
Experiment 4.3: Plasmolysis in Plant Cells
Passive Transport: Facilitated Diffusion
Active Transport

MODULE 5: CELLULAR ENERGY

Introduction (03:08)
ATP: the Energy Currency of Cells (04:53)
Photosynthesis: Making Energy-Packed Food (18:05)
Experiment 5.1: Pigments of Photosynthesis Paper Chromatography
The Light Reactions (06:25)
The Calvin Cycle (07:42)
Cellular Respiration: Making ATP (04:43)
Mitochondrial Design (01:03)
The Stages of Cellular Respiration (30:42)
Stage 1: Glycolysis
Stage 2: The Link Reaction
Stage 3: The Krebs Cycle
Stage 4: The Electron Transport Chain
Fermentation
Experiment 5.2: Cellular Respiration and Fermentation in Yeast

MODULE 6: DNA, PROTEINS, AND THE CELL CYCLE

Introduction (06:49)
DNA, Genes, and Chromosomes (01:21)
A Brief History of the Discovery of DNA (02:43)

Genes and Chromosomes (12:25)
Experiment 6.1: DNA Extraction
DNA Replication (04:46)
Protein Synthesis (03:09)
Protein Synthesis Part 1: Transcription—DNA to RNA (06:47)
Editing RNA
Protein Synthesis Part 2: Translation—RNA to Protein (12:15)
Adding Amino Acids
Summarizing Protein Synthesis
Cell Cycle and Cellular Reproduction (04:27)
Mitosis (15:17)
Prophase
Metaphase
Anaphase
Telophase and Cytokinesis
Experiment 6.2: Mitosis
Meiosis (18:59)
Counting Chromosomes
The Process of Meiosis
Meiosis I: Prophase I
Meiosis I: Metaphase I
Anaphase I
Telophase I and Cytokinesis
Prophase II
Metaphase II
Anaphase II
Telophase II and Cytokinesis

MODULE 7: GENETICS

Introduction (10:34)
Experiment 7.1: Environmental Factors and their Effect on Radish Leaf Color
Mendelian Genetics (03:00)
Mendel's Experiments (11:12)
Modern Terminology (08:47)
Inheritance and Meiosis
Punnett Squares (07:09)
Testcross (02:47)
Pedigrees (12:52)
Experiment 7.2: Making Your Own Pedigree
More Complex Crosses (16:24)
Meiosis and Dihybrid Crosses
Inheritance Patterns (00:21)
Sex-Linked Genetic Traits (09:32)
Non-Mendelian Inheritance Patterns (14:45)
Human Genetics (00:44)

MODULE 8: EVOLUTION

MODULE 9: PROKARYOTES AND VIRUSES

Autotrophs
Heterotrophs
Cellular Respiration
Conditions for Bacterial Growth
Reproduction
Genetic Variation in Bacteria
Conjugation
Transformation
Transduction
Bacteria in Nature
Chemical Recyclers and Bioremediation
Bacteria and Humans
Bacteria and Disease
Experiment 9.2: Bacterial Fermentation—Making Yogurt
Viruses (01:53)
Viral Structure (02:32)
How Viruses Infect (05:29)
The Lytic Cycle
The Lysogenic Cycle
Defenses Against Viruses (05:45)

MODULE 10: PROTISTS AND FUNGI

Introduction (01:26)
Introduction to Protists (08:10)
Experiment 10.1: Pond Life—Part A
General Characteristics of Protists (01:01)
Classifying Protists (01:05)
Animal-Like Protists—The Protozoans (14:50)
Protozoans with Pseudopodia—Sarcodines
Protozoans with Flagella—Zooflagellates
Protozoans with Cilia—Ciliates
Other Ciliates
Nonmotile Protozoans—Sporozoans
Fungus-Like Protists (04:55)
Slime Molds
Cellular Slime Molds
Acellular Slime Molds
Water Molds and Mildews
Plant-Like Protists—Euglena and Algae (18:50)
Euglena
Flame-Colored Algae—Dinoflagellates
Golden Algae—Diatoms
Green Algae
Other Members of Chrysophyta
Red Algae

MODULE 11: PLANT DIVERSITY AND REPRODUCTION

MODULE 12: PLANT STRUCTURE AND FUNCTION

MODULE 13: ANIMALS—INVERTEBRATES PT1

MODULE 14: ANIMALS—INVERTEBRATES PT2

MODULE 15: ANIMALS—CHORDATES PT1

MODULE 16: ANIMALS—CHORDATES PT2

- Introduction (01:42)
- Birds (00:30)
- Characteristics of Birds (13:00)
  - Endothermic
  - Four-Chambered Heart
  - Toothless Bill
  - Reproduction
  - A Bird's Ability to Fly
  - Feathers
  - Wings
  - Skeletal Structure
- Classification in Class Aves (07:44)
- Experiment 16.1: Bird Identification
- Mammals (00:39)
- Characteristics of Mammals (06:28)
  - Hair
  - Reproduction
  - Caring for Young
  - Endothermic with a Four-Chambered Heart
- Classification in Class Mammalia (14:20)
  - Monotremes
  - Marsupials
  - Placental Mammals
- Animal Behavior (01:45)
- Innate Behavior (07:40)
  - Fixed Action Pattern
  - Rhythmic Patterns of Behavior
- Learned Behavior (06:00)
  - Habituation
  - Imprinting
  - Conditioning
- Social Behaviors (08:50)
  - Competitive Behaviors
  - Aggressive Behavior
  - Territorial Behavior
  - Dominance Hierarchies
  - Courtship Behavior
  - Cooperation
- Summing it All Up (01:22)