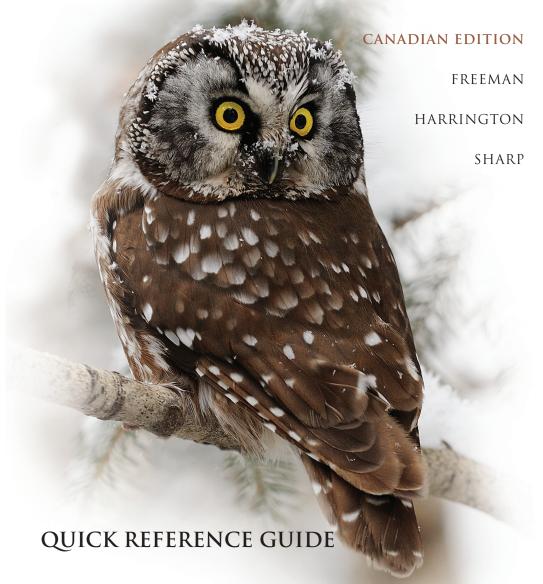
INSTRUCTOR RESOURCES

BIOLOGICAL SCIENCE





QUICK REFERENCE GUIDE

BIOLOGICAL SCIENCE , CANADIAN EDITION , FREEMAN, HARRINGTON, SHARP

INSTRUCTOR RESOURCES

Organized by chapter on DVDs 1-3 and in the For Instructors area at www.masteringbio.com:

PowerPoint® Lectures

- Active Lecture Questions (for use with classroom response systems)
- BLAST animations
- Label Edit Images (textbook figures and tables, with editable labels and leaders)
- Lecture Presentations (lecture outlines, selected Label
- Edit Images, and links to BioFlix™ and Web Animations)
- Step Edit Images (selected Label Edit Images layered for step-by-step presentation)

- JPEG Images
 Labeled Images (textbook figures and tables)
- Unlabeled Images (textbook figures)

Animations and Videos (see media grid)

- 8 BioFlix™ 3-D animations, plus PowerPoint® Slide
- Shows and Teaching Tips 84 BLAST animations
- · 7 Canadian Biology Animations
- 75 Cell Biology Videos
- 29 Discovery Channel™ Videos
- · 82 Web Animations based on textbook figures
- 11 GraphIt! activities

Instructor Guide

- · Biological Science Instructor Guide Chapter Quizzes
- Practicing Biology Instructor Guide
- Primary Literature Citations (to support figures that contain data and extensive text discussions of particular

Textbook Answers (online only)

Also on disc and in the For Instructors area at

Test Bank (separate CD)

Active Learning Workshop (separate DVD)

- Video Chapters:

 1. Introduction to Active Learning
- 2. Bloom's Taxonomy
- 3. Benefits for Students 4. Think-Pair-Share
- 6. Minute Papers
- 7. Using Clickers Part 1
- 8. Using Clickers Part 2
- 9. Concept Mapping 10. Just in Time Teaching

BONUS: Education Research Papers

Additional Instructor Resources are available on www.masteringbio.com:

- The Air We Breathe
- Does Hunting Select for Small-Horned Bighorn Sheep?

- . My Friend's Enemy: How an Invasive Weed Is
- Changing Native Hardwood Forests The Mystery of the Missing Bees
- · Uncertainty and Hope: Huntington's Disease-

One Family's Experience **New Canadian Biology Animations**

- The Signal Hypothesis (Chapter 7)
 Protein Sorting and Vesicle Transport (Chapter 7)
- A Motor Protein That Moves Along Microtubules (Chapter 7)
- STATs Activate Transcription after They Are Phosphorylated (Chapter 18)
- Epinephrine Triggers a Signal Transduction Cascade (Chapter 47)
- The Pine Beetle (Chapter 50)
- The Global Water Cycle (Chapter 54)

More BioFlix Animations

- Membrane Transport (Chapter 6)
- DNA Replication (Chapter 14)
- Mechanisms of Evolution (Chapter 24) Water Transport in Plants (Chapter 37)
- How Synapses Work (Chapter 45)
- Carbon Cycle (Chapter 54) Population Energy
- Gas Exchange

More Discovery Videos

An additional 20 videos added online

Keep an eve on the Instructor Resources area to see the latest developments.

STUDENT RESOURCES

Organized by chapter in the Study Area at www.masteringbio.com:

- Chapter Guide Key Concepts
- · Section-by-Section Chapter Outlines Review Quizzes
- Textbook Answers BioFlixTM (see media grid)
- Cell Biology Videos (see media grid)
- Discovery Channel™ Videos (see media grid)
- · Web Animations (see media grid) GraphIt! (see media grid)
- Web Links
- Also in the Study Area at www.masteringbio.com:

Audio Glossary, BioSkills, eBook

In the Assignment List at www.masteringbio.com: **Tutorials and Test Bank Questions**

	UNIT 1: THE MOLECULES OF LIFE (DVD 1)						UNIT 2: CELL STRUCTURE AND FUNCTION (DVD 1)			
1. BIOLOGY AND The tree of life	2. WATER AND CARBON: THE CHEMICAL BASIS OF LIFE	3. PROTEIN STRUCT	URE AND FUNCTION	4. NUCLEIC ACIDS AND THE RNA WORLD	5. AN INTRODUCTION TO CARBOHYDRATES	6. LIPIDS, MEMBRANES AND THE FIRST CELLS	7. INSIDE	THE CELL	8. CELL-CELL INTERACTIONS	9. CELLULAR RESPIRATION AND FERMENTATION
Case Study on www.masteringbio.com • Does Hunting Select for Small-Horned Bighorn Sheep? Discovery Videos • Cells • Charles Darwin Web Animations • Artificial Selection • Introduction to Experimental Design Graphit! • An Introduction to Graphing	BLAST Animations Hydrogen Bonds in Water Covalent Bonds Discovery Video Early Life Web Animation The Properties of Water	BLAST Animations Protein Primary Structure Protein Secondary Structure Alpha Helix Protein Tertiary and Quaternary Structure Building Proteins Unfolding and Refolding a Protein Structure of DNA Double Helix Hydrogen Bonds in DNA Roles of RNA Structure of ATP ATP/ADP Cycle Enzyme Regulation: Allosteric Enzyme Regulation: Chemical Modification Enzyme Regulation: Competitive Inhibition How Enzymes Work: Activation Energy How Enzymes Work: Types and Specificity	Cell Biology Videos An Idealized Alpha Helix: No Sidechains An Idealized Alpha Helix: No Sidechains An Idealized Beta Pleated Sheet Cartoon An Idealized Beta Pleated Sheet Closure of Hexokinase via Induced Fit Web Animations Condensation and Hydrolysis Reactions Activation Energy and Enzymes	BLAST Animations Structure of DNA Double Helix DNA and RNA Compared Gel Electrophoresis Hydrogen Bonds in DNA Roles of RNA Cell Biology Videos Stick Model of DNA Surface Model of DNA Web Animation Nucleic Acid Structure	Discovery Video • Antibiotics Web Animation • Structure and Function	BLAST Animations Active Transport: Sodium-Potassium Pump Plant Cell Wall Diffusion Passive Diffusion Across a Membrane Prokaryotic Cell Size Case Study on www.masteringbio.com Know Your Enemy Cell Biology Videos Sitic Model of Cholesterol Space-filing Model of Cholesterol Na*/K-ATPase Cycle Plasmolysis of Plant Cells Water Movement Through an Aquaporin Structure of the Cell Membrane Web Animations Diffusion and Osmosis Membrane Transport Proteins	BioFlix Tour of an Animal Cell Tour of a Plant Cell BLAST Animations Animal Cell Overview Endocytosis and Exocytosis Mitochondrion Cell Overview Plasmid Vacuole Vesicle Transport Canadian Biology Animations The Signal Hypothesis Protein Sorting and Vesicle Transport A Motor Protein That Moves Along Microtubules Cell Biology Videos Actin Network in Crawling Cells Actin Visualization in Dendrites Cytoplasmic Streaming Cytoskeleton Protein Dynamics ER and Mitochondria in Leaf Cells ER to Golgi Traffic	Motion of Isolated Flagellum Flagellum Movement in Swimming Sperm Golgi Complex in 3D Interphase Microtubule Dynamics Microtubule Dynamics Microtubule Sliding in Flagellum Movement Mitochondrion in 3D Movement of Organelles in vitro Movement of Organelles in vivo Phagocytosis in Action Secretion from the Golgi Statining of Endoplasmic Reticulum The Cytoskeleton in a Neuron Growth Cone Transport Along Microtubules Chloroplast Movement Cillary Motion Discovery Video Cells Web Animations Transport into the Nucleus A Pulse-Chase Experiment	BLAST Animations Signaling Across Membranes Signaling: Direct Signaling: Direct Signaling via Steroid Hormones Cell Biology Videos E-cadherin Expression Fibronectin Fibrils Staining of the Extracellular Matrix Cartoon Model of a Collagen Triple Helix Discovery Video Cells Web Animation Cell-Cell Communication	BioFlix • Cellular Respiration BLAST Animation • Harvesting Energy: Krebs Cycle Cell Biology Videos • Space-filling Model of ATP • Stick Model of ATP • ATP Synthase 3D Structure: Top View • ATP Synthase 3D Structure: Side View Web Animations • Glucose Metabolism • Redox Reactions
UNIT 2 (continued)		UNII 3: GENE SIRU	ICTURE AND EXPRESS	ION (DVD I)	<u> </u>				<u> </u>	
10. PHOTOSYNTHESIS	11. THE CELL CYCLE	12. MEIOSIS	13. MENDEL AND THE GENE	14. DNA AND THE GENE: SYNTHESIS AND REPAIR	15. HOW GENES WORK	16. TRANSCRIPTION AND TRANSLATION	17. CONTROL OF GENE EXPRESSION IN BACTERIA	18. CONTROL OF GENE EXPRESSION IN EUKARYOTES	19. ANALYZING AND ENGINEERING GENES	20. GENOMICS
BioFlix • Photosynthesis Cell Biology Video • Space-filling Model of Chlorophyll a Discovery Video • Space Plants Web Animations • Chemiosmosis • Photosynthesis • Strategies for Carbon Fixation	BioFlix Mitosis BLAST Animation Plant Cytokinesis Case Study on www.masteringbio.com Know Your Enemy Cell Biology Videos Mitosis Mitosis Mitosis Mitosis Muclear Envelope Formation Myosin and Cytokinesis Microtubules in Anaphase Discovery Video Fighting Cancer Web Animations The Phases of Mitosis The Cell Cycle	BioFlix • Meiosis BLAST Animations • Genetic Variation: Fusion of Gametes • Genetic Variation: Independent Assortment Cell Biology Videos • Meiosis I in Sperm Formation • Nondisjunction in Mitosis Web Animations • Meiosis • Mistakes in Meiosis	BLAST Animations • Single-Trait Crosses • Two-Trait Crosses Case Study on www.masteringbio.com • Uncertainty and Hope: Huntington's Disease—One Family's Experience Web Animations • Mendel's Experiments • The Principle of Independent Assortment	Web Animation • DNA Synthesis	Web Animations The One-Gene, One-Enzyme Hypothesis The Triplet Nature of the Genetic Code	BioFlix Protein Synthesis BLAST Animations Transcription Translation Case Study on www.masteringbio.com The Air We Breathe Cell Biology Video A Stick and Ribbon Rendering of a tRNA Discovery Video Antibiotics Web Animations Transcription Translation	Cell Biology Video • Cartoon Rendering of the lac Repressor from E. coli Web Animation • The lac Operon	Canadian Biology Animations STATS Activate Transcription after They Are Phosphorylated Cell Biology Videos Cartoon and Stick Model of a Nucleosomal Particle Cartoon Model of the GAL4 Transcription Factor from the Yeast S. cerevisiae Web Animation Transcription Initiation in Eukaryotes	BLAST Animation Genetic Recombination in Bacteria Case Study on www.masteringbio.com Uncertainty and Hope: Huntington's Disease—One Family's Experience The Air We Breathe Cell Biology Videos Pronuclear Injection GPP-expressing Transgenic Mice Discovery Video Transgenics Web Animations Producing Human Growth Hormone The Polymerase Chain Reaction	BLAST Animation DNA Fingerprinting Case Study on www.masteringbio.com Uncertainty and Hope: Huntington's Disease—One Family's Experience The Air We Breathe Discovery Video DNA Forensics Web Animation Human Genome Sequencing Strategies

21. PRINCIPLES OF DEVELOPMENT	22. AN INTRODUCTION TO ANIMAL DEVELOPMENT	23. AN INTRODUCTION TO PLANT DEVELOPMENT	24. EVOLUTION BY NATURAL SELECTION	25. EVOLUTIONARY PROCESSES	26. SPECIATION	27. PHYLOGENIES AND THE HISTORY OF LIFE
BLAST Animation • Stem Cells Cell Biology Video • Lamellipodia • Phosphate-Induced Apoptosis • Apoptosis in C. elegans Embryos Discovery Video • Cloning Web Animation • Early Pattern Formation in Drosophila	Cell Biology Videos Cortical Granule Fusion Following Egg Fertilization Calcium Wave Propagation in Fish Eggs Calcium Release Following Egg Fertilization Motion of Isolated Flagellum Flagellum Movement in Swimming Sperm Cleavage of a Fertilized Egg Web Animation Early Stages of Animal Development	(No media)	BLAST Animations • Evidence for Evolution: Homologous Limbs • Natural Selection Case Study on www.masteringbio.com • Does Hunting Select for Small-Horned Bighorn Sheep? Discovery Videos • Charles Darwin • Mass Extinctions Web Animation • Natural Selection for Antibiotic Resistance	Web Animations The Hardy-Weinberg Principle Three Modes of Natural Selection	Case Study on www.masteringbio.com • A Fishy Tale Web Animations • Allopatric Speciation • Speciation Changes in Ploidy	Discovery Video Mass Extinctions Web Animation Adaptive Radiation

UNIT 6: THE DIVERSIFICATION OF LIFE (DVD 2)									UNIT 7: HOW PLANTS WORK (DVD 3)		
28. BACTERIA AND ARCHAEA	29. PROTISTS	30. GREEN PLANTS	31. FUNGI	32. AN INTRODUCTION TO ANIMALS	33. PROTOSTOME ANIMALS	34. DEUTEROSTOME ANIMALS	35. VIRUSES	36. PLANT FORM AND FUNCTION	37. WATER AND SUGAR TRANSPORT IN PLANTS	38. PLANT NUTRITION	
BLAST Animation • Evidence for Evolution: Antibiotic Resistance in Bacteria Cell Biology Video • Demonstration of Chemotaxis Discovery Videos • Tasty Bacteria • Early Life • Bacteria • Fungi • Antibiotics Web Animation • The Tree of Life	Web Animation • Alternation of Generations in a Protist	BLAST Animation • Alternation of Generations Discovery Videos • Space Plants • Trees • Colored Cotton • Plant Pollination Web Animation • Plant Evolution and the Phylogenetic Tree	Case Study on www.masteringbio.com • My Friend's Enemy: How an Invasive Weed Is Changing Native Hardwood Forests Discovery Videos • Fungi • Leafcutter Ants Web Animation • The Life Cycle of a Mushroom	Web Animation • The Architecture of Animals	Discovery Video Invertebrates Web Animation Protostome Diversity	Case Study on www.masteringbio.com • An Ocean without Sharks Web Animation • Deuterostome Diversity	BLAST Animations AIDS Onset AIDS Treatment Strategies Structure of HIV Discovery Videos Emerging Diseases Vaccines Web Animation The HIV Replicative Cycle	Discovery Video Trees Web Animation Primary and Secondary Growth	Cell Biology Video Plasmolysis of Plant Cells Web Animation Solute Transport in Plants	Case Study on www.masteringbio.com My Friend's Enemy: How an Invasive Weed Is Changing Native Hardwood Forests Web Animation Soil Formation and Nutrient Uptake GraphIt! Global Soil Degradation	

UNIT 7 (continued)		UNIT 8: HOW ANIM	MALS WORK (DVD 3)							
39. PLANT SENSORY SYSTEMS, SIGNALS, AND RESPONSES	40. PLANT REPRODUCTION	41. ANIMAL FORM AND FUNCTION	42. WATER AND ELECTROLYTE BALANCE IN ANIMALS	43. ANIMAL NUTRITION	44. GAS EXCHANGE AND CIRCULATION	45. ELECTRICAL SIGNALS IN ANIMALS	46. ANIMAL SENSORY SYSTEMS AND MOVEMENT	47. CHEMICAL SIGNALS IN ANIMALS	48. ANIMAL REPRODUCTION	49. THE IMMUNE SYSTEM IN ANIMALS
Web Animations Plant Defenses Plant Hormones Sensing Light	BLAST Animations • Flowering Structure • Flowering Plant Life Cycle • Non-Flowering Plant Life Cycle • Pollination and Fertilization Case Study on www.masteringbio.com • The Mystery of the Missing Bees Discovery Videos • Colored Cotton • Plant Pollination Web Animations • Reproduction in Flowering Plants • Fruit Structure and Development	BLAST Animations Eukaryotic Cell Shape and Surface Area Feedback Loops Positive Feedback: Labor Negative Feedback: Body Temperature Surface Area to Volume Calculator Discovery Video An Introduction to the Human Body Web Animations Surface Area/Volume Relationship Homeostasis	BLAST Animations • Kidney Anatomy • How the Kidney Works Web Animation • The Mammalian Kidney	Discovery Video • Nutrition Web Animations • The Digestion and Absorption of Food • Understanding Diabetes Mellitus	BLAST Animations • Anatomy of the Heart • The Cardiac Cycle Overview • Electrical Coordination of the Cardiac Cycle Discovery Video • Blood Web Animation • Gas Exchange in the Lungs and Tissues • The Heart	BioFlix How Neurons Work BLAST Animations Action Potentials Signaling Amplification in Neurons Signaling: Neural Signal Transmission at Synapses Cell Biology Video Dendrites of a Neuron Discovery Videos Novelty Gene Teen Brains Web Animations Membrane Potentials Action Potentials	BioFlix • Muscle Contraction BLAST Animations • Muscle Anatomy Cell Biology Videos • Myosin-Actin Interaction • Cardiac Muscle Contraction Discovery Video • Muscles and Bones Web Animations • The Vertebrate Eye • Muscle Contraction	BLAST Animations Signaling: Endocrine Signaling: Paracrine Canadian Biology Animations Epinephrine Triggers a Signal Transduction Cascade Cell Biology Video A Cartoon Model of the DNA Binding Motif of a Zinc Finger Transcription Factor Binding to DNA Discovery Video Endocrine System Web Animations Endocrine System Anatomy Hormone Actions on Target Cells	Discovery Video Cloning Web Animations Human Gametogenesis Human Reproduction	BLAST Animations Adaptive Immunity Innate Immunity Cell Biology Videos Chemotaxis of a Neutrophil Leukocyte Adhesion and Rolling Discovery Videos Fighting Cancer Emerging Diseases Vaccines Web Animations The Inflammatory Response The Acquired Immune Response

50. AN INTRODUCTION TO ECOLOGY	51. BEHAVIOR	52. POPULATION ECOLOGY	53. COMMUNITY ECOLOGY	54. ECOSYSTEMS	55. BIODIVERSITY AND CONSERVATION BIOLOGY
Canadian Biology Animations The Pine Beetle Discovery Video Rain Forests Web Animation Tropical Atmospheric Circulation	Discovery Videos Novelty Gene Teen Brains Web Animation Homing Behavior in Digger Wasps	BLAST Animations Population Dynamics Web Animations Modeling Population Growth Human Population Growth and Regulation Graphit! Age Pyramids and Population Growth	Case Study on www.masteringbio.com • My Friend's Enemy: How an Invasive Weed Is Changing Native Hardwood Forests Discovery Videos • Leafcutter Ants • Introduced Species Web Animations • Life Cycle of a Malaria Parasite • Primary Succession GraphIt! • Species Area Effect and Island Biogeography	BLAST Animations Carbon Cycle Energy Flow The Greenhouse Effect Nitrogen Cycle Canadian Biology Animations The Global Water Cycle Discovery Video Trees Web Animation The Global Carbon Cycle Caphit! Animal Food Production Efficiency and Food Policy Atmospheric CO ₂ and Temperature Changes Municipal Solid Waste Trends in the US Global Freshwater Resources Prospects for Renewable Energy	Web Animation • Habitat Fragmentation Grapht! • Forestation Change • Global Fisheries and Overfishing