MAINE
Science and Technology
Secondary Grades
Biology: The Dynamics of Life © 2004

OBJECTIVES	PAGE REFERENCES
A. CLASSIFYING LIFE FORMS **Students will understand that there are similarities within the diversity of all living things. Students will be able to:**	
SECONDARY GRADES	
1. Explain the role of DNA in resolving questions of relationship and evolutionary change.	SE: 402-403, 451 *BioTechnology* 462 TWE: TTPK 401
2. Describe similarities and differences among organisms within each level of the taxonomic system for classifying organisms (kingdom through species).	SE: 449, 450-459 *Focus On* 1070-1073 TWE: PR 457 VL 457 QD 1071
3. Analyze the basic characteristics of living things, including their need for food, water, and gases and the ability to reproduce.	SE: 6-10 *MiniLab* 6 *BioDigest* 30 TWE: CA 7 QD 7 EX 10 MA 30
B. ECOLOGY **Students will understand how living things depend on one another and on non-living aspects of the environment. Students will be able to:**	
SECONDARY GRADES	
1. Illustrate the cycles of matter in the environment and explain their interrelationships.	SE: 52-54, 56-57 *Inside Story* 55 *BioDigest* 133 TWE: RE 53, 56 PR 55
2. Compare the process of photosynthesis and respiration, and describe the factors that affect them.	SE: 225-230, 231-235, 237 *Skill Review #7* 237 *Internet BioLab* 238-239 TWE: AS 239
3. Analyze the factors that affect population size (e.g., reproductive and survival rates).	SE: 91-99, 100-103 *MiniLab* 92, 102 *Problem-Solving Lab* 95 TWE: CA 93 AL 96-97 IN 97

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4. Analyze the impact of human and other activities on the type and pace of change in the ecosystems.	SE: 116-120, 121-125 *Biology and Society* 60, 600 TWE: QD 117 EN 119 DIN 120 MAS 123
C. CELLS **Students will understand that cells are the basic units of life. Students will be able to:**	
SECONDARY GRADES	
1. Relate the parts of a cell to its function.	SE: 179-187 *Investigate BioLab* 188-189 *BioDigest* 246 TWE: DIN 187, 247
2. Illustrate how cells replicate and transmit information, including the roles of DNA and RNA.	SE: 203-210, 263-269, 281-287, 288-295 *BioDigest* 247, 361-362 *MiniLab* 293 *Investigate BioLab* 302-303 TWE: UM 206 IS 265
3. Discuss the function of the important "molecules of life" – proteins (including enzymes and hormones), carbohydrates, lipids, and nucleic acids.	SE: 157-163 *BioDigest* 245 TWE: QD 159 EN 159 DIN 163
4. Explain how the human body protects itself against disease and how the body might lose that ability.	SE: 1031-1041 *Problem-Solving Lab* 1040 *BioDigest* 1055 TWE: RE 1033 EN 1036 CD 1037 DIN 1041
5. Analyze and debate basic principles of genetic engineering: how it is done, its uses, and some ethical implications.	SE: 341-348 *MiniLab* 343 *Problem-Solving Lab* 347 *Investigate BioLab* 354-355 *BioDigest* 363 TWE: EN 345 DIN 348
D. CONTINUITY AND CHANGE **Students will understand the basis for all life and that all living things change over time. Students will be able to:**	
SECONDARY GRADES	
1. Explain how mutations can be caused by gene mutation or chromosomal alteration and describe the possible results of such mutations on individuals or populations.	SE: 296-301, 404-407 *Problem-Solving Lab* 299 *MiniLab* 300 TWE: EN 297 IS 298 CA 300

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2. Describe why the offspring of sexually reproducing species have different survival rates than those of asexually reproducing species under a variety of conditions. Describe the advantages and disadvantages of each.	SE: 269-270, 407-408, 634 *BioDigest* 361
3. Explain and document the importance of relatively short-term changes (e.g., one generation) on a species' survival.	SE: 404-413 *Problem-Solving Lab* 397 TWE: PR 400 AL 408
4. Describe how genetic manipulation can cause unusually rapid changes in species.	SE: 337-340, 341-348 *Problem-Solving Lab* 347 *BioDigest* 363 *Focus On* 1066-1067 TWE: IN 345, 400
5. Compare and contrast fertilization, zygote formation, and embryo development in humans and other species.	SE: 402, 676-679, 1005-1010 *Problem-Solving Lab* 676 *Internet BioLab* 686-687 *MiniLab* 1006 TWE: DVB 402
6. Analyze a theory scientists use to explain the origin of life.	SE: 380-383 *Biology and Society* 388 *BioDigest* 467 TWE: QD 381 VL 381 CA 388 GF 388
7. Explain both the evidence used to develop the geologic time scale and why an awareness of geologic time is important to an understanding of the process of change in the universe as well as on earth.	SE: 369-379 *MiniLab* 376 *BioDigest* 466 TWE: CDIV 370 UM 375 CE 375 IN 377, 378

Codes Used for TWE Pages

AL	Additional Lab
AS	Assessment
CA	Challenge Activity
CD	Concept Development
CDIV	Cultural Diversity
CE	Chalkboard Example
DIN	Daily Intervention
DVB	Different Viewpoints in Biology
EN	Enrichment
EX	Extension
GF	Going Further
IN	Inquiry
IS	Inclusion Strategy
MA	Microscope Activity
MAS	Modified Assessment
PR	Project
QD	Quick Demo
RE	Reinforcement
TTPK	Tying to Prior Knowledge
UM	Using Models
VL	Visual Learning