



**WASHINGTON**  
**Essential Academic Learning Requirements—Science**  
**Benchmark—Grade 10**  
*Biology: The Dynamics of Life* © 2004

BENCHMARKS	PAGE REFERENCES
<b>1. SYSTEMS: The student understands and uses scientific concepts and principles to understand systems.</b>	
<b>1.1 Properties of Systems: Use properties to identify, describe, and categorize substances, materials, and objects and use characteristics to categorize living things.</b>	
<b>LIFE SCIENCE</b>	
6. Classify organisms into distinct groups according to structural, cellular, biochemical, and genetic characteristics.	SE: 445-449, 450-453, 456-459 <i>MiniLab</i> 446, 453 <i>Problem-Solving Lab</i> 447 <i>Design Your Own BioLab</i> 570-571 <i>Focus On</i> 1070-1073 TWE: VL 451 UM 453
<b>1.2 Structure Systems: Recognize the components, structure, and organization of systems and the interconnections within and among them.</b>	
1. Analyze systems, including the inputs and outputs of a system and its subsystems.	SE: 36-43, 46-54, 56-57, 222-224, 896, 929-932 <i>Inside Story</i> 55, 162 <i>Problem-Solving Lab</i> 896, 932 TWE: QD 53 EN 933
<b>LIFE SCIENCE</b>	
6. Understand that specific genes regulate the functions performed by structures within the cells of multicellular organisms.	SE: 211, 263, 288-295 <i>BioDigest</i> 360, 361-362 TWE: VL 362
7. Describe how genetic information (DNA) in the cell is controlled at the molecular level and provides genetic continuity between generations.	SE: 211, 253, 265-266, 281-287, 288-295, 296-297 <i>MiniLab</i> 293 <i>BioDigest</i> 361-362 TWE: CA 294 AS 295
8. Compare and contrast the specialized structural and functional systems that regulate human growth and development, and maintain health.	SE: 930, 1013, 1031-1033, 1035-1040 <i>Investigate BioLab</i> 1017 <i>BioTechnology</i> 1018 <i>Inside Story</i> 1034 <i>MiniLab</i> 1035 TWE: CA 931

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<b>1.3 Changes in Systems: Understand how interactions within and among systems cause changes in matter and energy.</b>	
<b>LIFE SCIENCE</b>	
8. Explain how organisms and ecosystems can sustain life by obtaining, transporting, transforming, releasing, and eliminating matter and energy.	SE: 46-54, 56-57 <i>Problem-Solving Lab</i> 50 <i>Physical Science Connection</i> 52 <i>Inside Story</i> 55 <i>BioDigest</i> 133-134 TWE: BJ 49 CA 53 MA 57
9. Investigate and examine the scientific evidence used to develop the theory of biological evolution, and the concepts of speciation, adaptation, and biological diversity.	SE: 393-403, 404-413 <i>Problem-Solving Lab</i> 397 <i>Internet BioLab</i> 414-415 <i>BioDigest</i> 468-469 TWE: PO 399 TTPK 401 RE 408 CA 411 EX 413
10. Compare and contrast the complex factors (biotic and abiotic) that affect living organisms' interactions in biomes, ecosystems, communities, and populations.	SE: 37-41, 44-45, 96-99 <i>MiniLab</i> 36 <i>Design Your Own BioLab</i> 58-59 <i>BioDigest</i> 132-133 TWE: CA 37 RE 38 UST 133
<b>2. INQUIRY: The student knows and applies the skills, processes, and nature of science inquiry.</b>	
<b>2.1 Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.</b>	
1. Study and analyze questions and related concepts that guide scientific investigations.	SE: 11-18, 19-22 <i>BioDigest</i> 30 <i>Design Your Own BioLab</i> 58-59, 164-165, 496-497 TWE: UAA 11 AL 12-13 IN 17 EN 21
2. Plan, conduct, and evaluate systematic and complex scientific investigations, using appropriate technology, multiple measures, and safe approaches.	SE: <i>Design Your Own BioLab</i> 58-59, 164-165, 496-497, 522-523, 734-735 <i>Internet BioLab</i> 544-545, 626-627 <i>Investigate BioLab</i> 964-965 TWE: AL 12-13
3. Formulate and revise scientific explanations and models using logic and evidence; recognize and analyze alternative explanations and predictions.	SE: 16, 18 <i>Design Your Own BioLab</i> 58-59, 330-331, 522-523 <i>Internet BioLab</i> 274-275, 544-545, 626-627 <i>Biology and Society</i> 388 <i>Problem-Solving Lab</i> 514

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4. Use mathematics, computers and/or related technology to model the behavior of objects, events, or processes; analyze advantages and limitations of models.	SE: <i>Investigate BioLab</i> 104-105, 386-387 <i>Problem-Solving Lab</i> 291 <i>MiniLab</i> 350 <i>Internet BioLab</i> 414-415, 626-627 TWE: CA 101
5. Research, interpret, and defend scientific investigations, conclusions, or arguments; use data, logic, and analytical thinking as investigative tools; express ideas through visual, oral, written, and mathematical expression.	SE: <i>Design Your Own BioLab</i> 58-59, 164-165, 330-331, 834-835 <i>Internet BioLab</i> 274-275, 544-545 TWE: AS 59, 165, 275, 835
<b>2.2 Nature of Science: Understand the nature of scientific inquiry.</b>	
1. Analyze and explain why curiosity, honesty, openness, and skepticism are integral to scientific inquiry.	SE: 11-18 <i>Focus On</i> 1060-1061 TWE: IN 1060 CB 1061
2. Identify and analyze factors that limit the extent of scientific investigation.	SE: 21-22 TWE: EX 23 DIV 30
3. Compare, contrast, and critique divergent results from scientific investigations based on scientific arguments and explanations.	SE: <i>Internet BioLab</i> 274-275, 414-415, 544-545, 626-627 TWE: BR 15 PR 1061
4. Analyze and evaluate the quality and standards of investigative processes and procedures.	SE: 11-18, 19-21 <i>Problem-Solving Lab</i> 16 <i>Internet BioLab</i> 24-25 <i>Design Your Own BioLab</i> 164-165, 522-523 TWE: CA 17 EN 21 IN 1060
5. Know that science involves testing, revising, and occasionally discarding theories; understand that scientific inquiry and investigation lead to a better understanding of the natural world and not to absolute truth.	SE: 11-18, 21-22, 380-383 <i>Focus On</i> 1060-1061 TWE: BR 15 EX 18 UM 381 VL 381
<b>3. DESIGN: The student knows and applies the design process to develop solutions to human problems in societal contexts.</b>	
<b>3.1 Designing Solutions: Apply design processes to develop solutions to human problems or meet challenges using the knowledge and skills of science and technology.</b>	
1. Study and analyze challenges or problems from local, regional, national, or global contexts in which science/technology can be or has been used to design a solution.	SE: 121-125, 345, 347-348, 351-353 <i>Problem-Solving Lab</i> 124 <i>BioTechnology</i> 304, 356 TWE: BJ 353
2. Research, model, simulate, and test alternative solutions to a problem.	SE: <i>Design Your Own BioLab</i> 834-835 TWE: AS 115

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3. Propose, revise, and evaluate the possible constraints, applications, and consequences of solutions to a problem or challenge.	SE: <i>Connection to Chemistry</i> 106 <i>Problem-Solving Lab</i> 124 <i>Biology and Society</i> 600, 990, 1044 TWE: IN 123 AS 124 GF 600
<b>3.2 Science, Technology, &amp; Society: Know that science and technology are human endeavors, interrelated to each other, to society, and to the workplace.</b>	
1. Analyze how scientific knowledge and technological advances discovered and developed by individuals and communities in all cultures of the world contribute to changes in societies.	SE: 21-23, 281-283, 337-338, 345, 347-348, 351-353, 1039-1040 <i>Problem-Solving Lab</i> 124 TWE: EN 282 AL 350-351 BJ 1039
2. Analyze how the scientific enterprise and technological advances influence and are influenced by human activity, <i>for example, societal, environmental, economical, political, or ethical considerations.</i>	SE: 21-23 <i>Biology and Society</i> 26, 60, 600, 1044 <i>Connection to Chemistry</i> 106 TWE: IN 345 GF 600, 1044
3. Investigate the scientific, mathematical, and technological knowledge, training, and experience needed for occupational/career areas of interest.	SE: <i>Careers in Biology</i> 38, 297, 674, 974 <i>Biotechnology Careers</i> 230, 958 TWE: TP 230, 297, 674, 958, 974
4. Analyze the effects of natural events and human activities on the earth's capacity to sustain biological diversity.	SE: 115-120 <i>Biology and Society</i> 60, 600, 716 <i>Problem-Solving Lab</i> 115 TWE: QD 117 EN 117 AL 118-119

### Codes Used for TWE Pages

AL	Additional Lab	MA	Modified Assessment
AS	Assessment	PO	Portfolio
BJ	Biology Journal	PR	Project
BR	Brainstorming	QD	Quick Demo
CA	Challenge Activity	RE	Reinforcement
CB	Content Background	TP	Tech Prep
DIV	Daily Intervention	TTPK	Tying to Prior Knowledge
EN	Enrichment	UAA	Using an Analogy
EX	Extension	UM	Using Models
GF	Going Further	UST	Using Science Terms
IN	Inquiry	VL	Visual Learning