



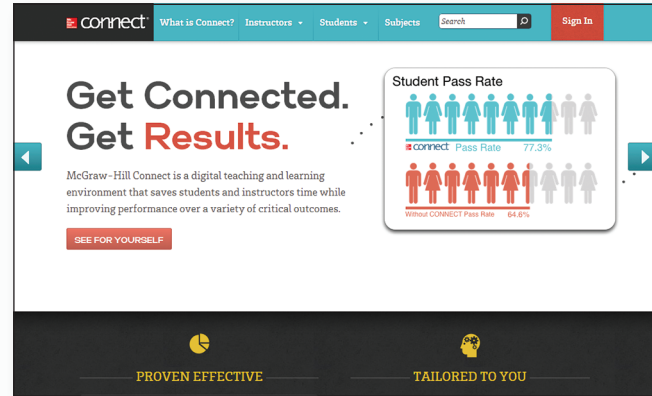
Teaching and Learning Tools



McGraw-Hill Connect® is a web-based assignment and assessment platform that gives students the means to better

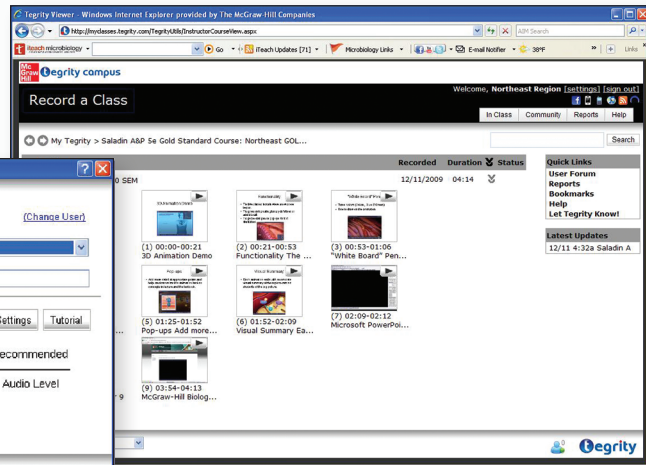
connect with coursework, instructors, and important concepts that they will need to know for success now and in the future.

McGraw-Hill Connect Plus® provides students with all the advantage of Connect Biology, plus a dynamic, media-rich eBook. To learn more visit www.mcgrawhillconnect.com



Tegrity Campus® is a lecture capture web service that allows you to easily record every class for every student. Tegrity is available as an integrated feature of Connect Biology and as a standalone.

- Make your classes available anytime, anywhere
- Simple one-click recording. No IT assistance required.
- Students can search a word or phrase and be taken to the exact place in your lecture they need to view.



Integrated within Connect and available as a standalone, **McGraw-Hill LearnSmart™** is the premier learning system designed to effectively assess a student's knowledge of course content. Through a series of adaptive questions, LearnSmart intelligently pinpoints concepts the student does not understand and maps out a personalized study plan for success. LearnSmart prepares students with a base of knowledge, allowing instructors to focus valuable class time on higher-level concepts.

New **SmartBook™** facilitates the reading process by identifying what content a student knows and doesn't know through adaptive assessments. As the student reads, the reading material constantly adapts to ensure the student is focused on the content he or she needs the most to close any knowledge gaps.

See pages xii-xiii of the preface for more information about the **LearnSmart Advantage™** suite of adaptive tools or go to www.LearnSmartAdvantage.com.

The Best of Both Worlds



McGraw-Hill and Blackboard Inc. teamed up to deliver the first to market integrated course solution which offers the deepest integration of publisher content within an LMS for Blackboard versions 8.0, 9.0, and 9.1.

Connect Single Sign-on. A single login and single environment provide seamless access to all course resources—all McGraw-Hill's resources are available within the Blackboard Learn platform.

Deep Integration. One-click access to McGraw-Hill Connect assignments and tools—all from within Blackboard Learn™.

One Gradebook. Automatic grade synchronization with Blackboard gradebook. All grades for McGraw-Hill assignments are recorded in the Blackboard gradebook automatically.

Instructor Resources

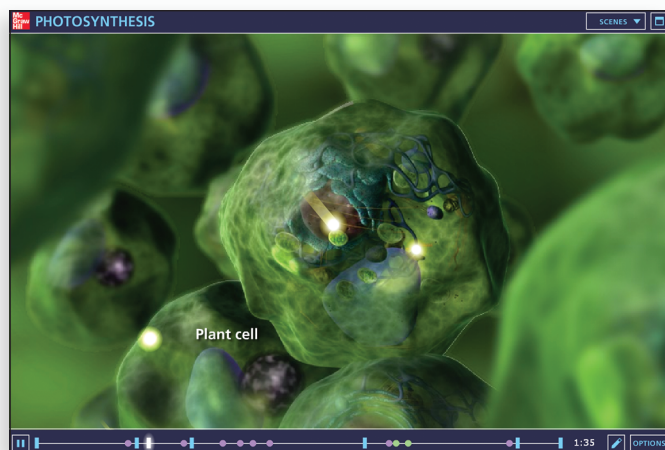
Connect Biology provides easy access to the following resources:

Presentation Tools

- Enhanced image PowerPoints® with editable art
- Lecture PowerPoints with animations
- Animation PowerPoints
- Labeled and unlabeled JPEG files of art, photos, and tables from the textbook.
- Instructor's Manual containing chapter outlines, lecture enrichment ideas, and discussion questions.
- Laboratory Resource Guide to accompany the *Concepts of Biology Laboratory Manual*

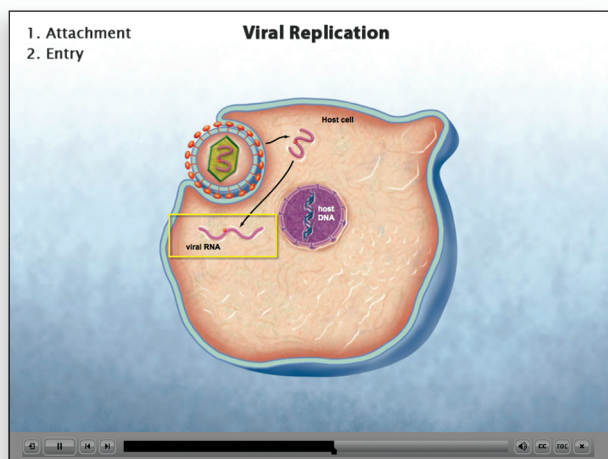
Animations for a New Generation

Dynamic, 3D animations of key biological processes bring an unprecedented level of control to the classroom. Innovative features keep the emphasis on teaching rather than entertaining.



New Guided Tutorials

Prepared by the authors of the textbook to assist students in understanding some of the more difficult topics in biology. Each video explores a specific figure in the text and is narrated by Mader series co-author Michael Windelspecht. During the video, important terms and processes are called out, allowing the student to focus on the key aspects of the figure. A list of tutorials can be found on page vi of the preface.

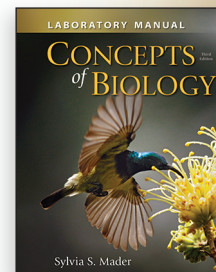


Computerized Test Bank

A comprehensive bank of test questions is provided within a computerized test bank powered by McGraw-Hill's flexible electronic testing program, **EZ Test Online**. A new tagging scheme allows you to sort questions by Bloom's difficulty level, learning outcome, topic, and section. With EZ Test Online, instructors can select questions from multiple McGraw-Hill test banks or author their own, and then either print the test for paper distribution or give it online.

Laboratory Manual

The *Concepts of Biology Laboratory Manual* is written by Dr. Sylvia Mader. Every laboratory has been written to help students learn the fundamental concepts of biology and the specific content of the chapter to which the lab relates, as well as gain a better understanding of the scientific method.



Companion Website

www.mhhe.com/maderconcepts3

The *Concepts of Biology* companion website allows students to access a variety of free digital learning tools that include

- Animations, videos, and MP3 files
- Chapter-level quizzing
- Vocabulary flashcards
- Virtual Labs
- Biology Prep

Create

Design your teaching resources to match the way you teach! With McGraw-Hill Create™ you can easily rearrange chapters, combine material from other content sources, and quickly upload content you have written. Access thousands of leading McGraw-Hill textbooks for content that fits your objectives and arrange your book to fit your teaching style. Create even allows you to personalize your book's appearance by selecting the cover and adding your name, school, and course information. Order a Create book and you'll receive a complimentary print review copy in 3–5 business days or a complimentary electronic review copy (eComp) via email in minutes. Go to www.mcgrawhillcreate.com today and register to experience how McGraw-Hill Create™ empowers you to teach *your* students *your* way.





The LearnSmart Advantage

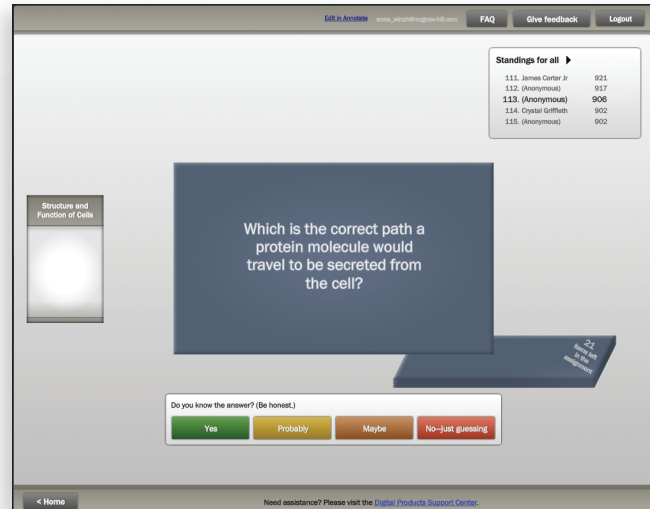


LEARNSMART[®]

LearnSmart is the only truly adaptive learning system that intelligently identifies course-content students have not yet mastered and maps out personalized study plans for their success.

When LearnSmart has identified a specific subject area where the student is struggling, he or she is given a “time out” and directed to the textbook section and learning objective for remediation.

Dynamically generated reports document student progress and areas for additional reinforcement, offering at-a-glance views of their strengths and weaknesses.



SMARTBOOK[™]

Powered by an intelligent diagnostic and adaptive engine, **SmartBook** facilitates the reading process by identifying what content a student knows and doesn't know through adaptive assessments.

As the student reads, the reading material constantly adapts to ensure the student is focused on the content he or she needs the most to close any knowledge gaps.

SMARTBOOK Human Biology, 13e, Mader Exploring Life and Science

PREVIEW READ PRACTICE RECHARGE Assignment completion

Chapter 1 Exploring Life and Science 5

may use a variety of mechanisms to move, but movement in humans and other animals is dependent upon their nervous and musculoskeletal systems. The leaves of plants track the passage of the sun during the day; when a houseplant is placed near a window, its stems bend to face the sun. The movement of an animal, whether self-directed or in response to a stimulus, constitutes a large part of its behavior. Some behaviors help us acquire food and reproduce.

Organisms Reproduce and Grow

Reproduction is a fundamental characteristic of life. Cells come into being only from pre-existing cells, and all living things have parents. When organisms **reproduce**, they pass on their genetic information to the next generation. Following the fertilization of the egg by a sperm cell, the resulting zygote undergoes a rapid period of growth and development. This is common in almost all living organisms. Figure 1.4a illustrates that an acorn progresses to a seedling before it becomes an adult oak tree. In humans, growth occurs as the fertilized egg develops into a fetus (Fig. 1.4b). **Growth**, recognized by an increase in size and often the number of cells, is a part of development. In multicellular organisms, such as humans, the term **development** is used to indicate all the changes that occur from the time the egg is fertilized until death. Therefore, it includes all the changes that occur during childhood, adolescence, and adulthood. Development also includes the repair that takes place following an injury.

The genetic information of all life is deoxyribonucleic acid, or DNA. DNA contains the hereditary information that directs not only the structure of each cell but also its function. The information in the DNA is contained within **genes**, short sequences of hereditary material that specify the instructions for a specific trait. Before reproduction occurs, DNA is replicated so that an exact copy of each gene may be passed on to the offspring. When humans reproduce, a sperm carries genes contributed by a male into the egg, which contains genes contributed by a female. The genes direct both growth and development so that the organism will eventually resemble the parents. Sometimes, **mutations** may cause minor variations in these genes, potentially causing an organism to be better suited for its environment. These mutations are the basis of evolutionary change.

Organisms Have an Evolutionary History

Evolution is the process by which a population changes over time. When a new variation arises that allows certain members of a population to capture more resources, these members tend to survive and have more offspring than the other, unchanged members. Therefore, each successive generation will include more members with the new variation, which represents an **adaptation** to the environment. Consider, for example, populations of humans that live at high altitudes, such as the cultures living at elevations of over 4,000 meters (m) (14,000 ft) in the Tibetan Plateau. This environment is very low in oxygen. As the Science feature, “Adapting to Life at High Elevations,” investigates, these populations have evolved an adaptation that actually reduces the amount of hemoglobin, the oxygen-carrying pigment in the blood. As the feature explains, this adaptation makes life at these altitudes possible. Evolution, which has been going on since the origin of life and which will continue as long as life exists, explains both the unity and the diversity of life. All organisms share the same characteristics of life because their ancestry can be traced to the first cell or cells. Organisms are diverse because they are adapted to different ways of life.

BIOLOGY MATTERS Science

Adapting to Life at High Elevations

Humans, like all other organisms, have an evolutionary history. This not only means that we share common ancestors with other animals, but that over time, we demonstrate adaptations to changing environmental conditions. One such study of populations living in the high-elevation mountains of Tibet (Fig. 1A) demonstrates how the processes of evolution and adaptation influence humans.

Normally, if a person moves to a higher altitude, his or her body responds by making more hemoglobin, the component of blood that carries oxygen, which thickens the blood. For minor elevation changes, this does not present much of a problem. But for people that live at extreme elevations (some people in the Himalayas can live at elevations of over 14,000 ft), the oxygen levels are much lower than people living at lower altitudes, thus allowing these

Figure 1A
Individuals living at high elevations, such as these Tibetans, have become adapted to their environment.

The gene is *EPAS1*, a gene on chromosome 2 of humans. *EPAS1* produces a transcription factor, which basically acts as a regulator of which genes are turned on and off in the body, a process called gene expression. The transcription factor produced by *EPAS1* has a number of functions in the body. For example, in addition to controlling the amount of hemoglobin in the blood, this transcription factor also regulates other genes that direct how the body uses oxygen.

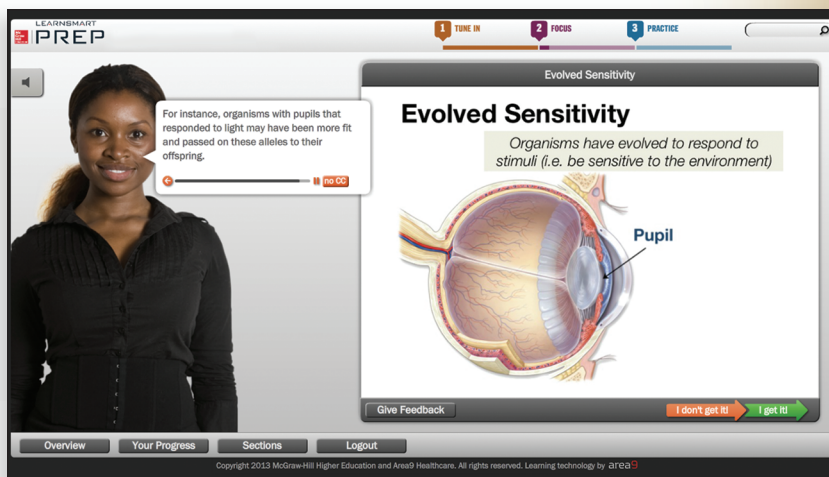
When the researchers examined the variations in *EPAS1* in the Tibetan population, they discovered that their version greatly reduces the production of hemoglobin. Therefore, the Tibetan population has lower hemoglobin levels than people living at lower altitudes, thus allowing these

The Evolution of Learning

- MCGRAW-HILL LEARNSMART • SMARTBOOK • LEARNSMART PREP • LEARNSMART LABS • LEARNSMART ACHIEVE • LEARNSMART MASTER

LEARNSMART PREP™

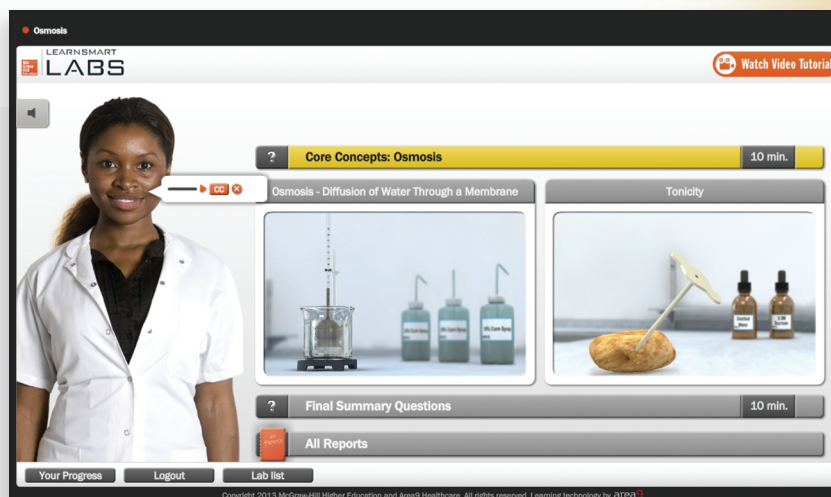
LearnSmart Prep quickly and efficiently prepares students for a college level course. Prep uses a set of diagnostic questions to help identify what a student knows and doesn't know. It then provides a unique learning plan focused on helping the student master the basic skills and concepts he or she needs the most before entering the classroom.



LEARNSMART LABS™

LearnSmart Labs is a super-adaptive simulated lab experience that brings meaningful scientific exploration to students. Through a series of adaptive questions, LearnSmart Labs identifies a student's knowledge gaps and provides resources to quickly and efficiently close those gaps. Once the student has mastered the necessary basic skills and concepts, they engage in a highly realistic simulated lab experience that allows for mistakes and the execution of the scientific method.

Whether your need is to overcome the logistical challenges of a traditional lab, provide better lab prep, improve student performance, or make your online experience one that rivals the real world, LearnSmart Labs accomplishes it all.



AN INNOVATIVE SUITE OF **ADAPTIVE LEARNING PRODUCTS** FUELED BY INTELLIGENT AND PROVEN LEARNING TECHNOLOGY

www.LearnSmartAdvantage.com