



## Biology: How Life Works, Volume 2

*James R. Morris, Daniel L. Hartl, Andrew H. Knoll, Robert A. Lue*

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*Rethinking biology means rethinking the text, the visual program, and assessment.*

Ordinarily, textbooks are developed by first writing chapters, then making decisions about art and images, and finally, once the book is complete, assembling a test bank and ancillary media. This process dramatically limits the integration across resources, and reduces art, media, and assessments to ancillary material, rather than essential resources for student learning.

*Biology: How Life Works* is the first project to develop three pillars—the text, the visual program, and the assessment—at the same time. All three pillars were developed in parallel to make sure that each idea is addressed in the most appropriate medium, and to ensure authentic integration. These three pillars are all tied to the same set of core concepts, share a common language, and use the same visual palette. In this way, the text, visual program, and assessments are integral parts of student learning, rather than just accessories to the text.

## RETHINKING THE TEXT

### Integrated

*Biology: How Life Works* moves away from a focus on disparate topics, towards an integrated approach. Chemistry is presented in context, structure and function are covered together, the flow of information in a cell is introduced where it makes the most conceptual sense, and cases serve as a framework for connecting and assimilating information.

### Selective

*Biology: How Life Works* was envisioned not as a reference book for all of biology, but a resource focused on foundational concepts, terms, and experiments. This allows students to more easily identify, understand, and apply critical concepts, and develop a framework on which to build their understanding of biology.

### Thematic

*Biology: How Life Works* was written with six themes in mind. Introduced in Chapter 1 and revisited throughout, these themes provide a framework that helps students see biology as a set of connected concepts. In particular, the theme of evolution is emphasized for its ability to explain and predict so many patterns in biology.

## RETHINKING THE VISUAL PROGRAM

### Integrated

Across *Biology: How Life Works*—whether students are looking at a figure in the book, watching an animation, or interacting with a simulation—they always see a consistent use of color, shapes, and design.

### Engaging

Every image—still and in motion—engages students by being vibrant, clear, and approachable. The result is a visual environment that is expertly designed to pull students in, deepens their interest, and helps them see a world of biological processes.

## A Visual Framework

To help students think like biologists, the visual program is designed to be a framework for students to hang the concepts and connect ideas. Individual figures present foundational concepts; Visual Synthesis figures tie multiple concepts across chapters together; animations bring these figures to life; and simulations let students interact with the concepts. Collectively, this visual framework allows students to move seamlessly back and forth between the big picture and the details.

## **RETHINKING THE ASSESSMENT**

### **Range**

Developed by a broad community of leading science educators, the assessments for *Biology: How Life Works* address all types of learning, from recall to synthesis. They are designed to be used in a variety of settings and come in a wide range of formats (multiple choice, true/false, free response).

### **Integrated**

Assessment is seamlessly integrated into the text and the visual program (both in print and interactive). Each time an instructor asks a student to engage with *Biology: How Life Works*—whether it is reading a chapter, watching an animation, or working through an experiment—the opportunity to assess that experience exists.

### **Connected**

Many of the questions and activities for *Biology: How Life Works* are organized in sets called Progressions. Questions in a Progression are aligned with one or more core concepts, and are designed to move a student from basic knowledge to higher order skills and deeper understanding. Progressions questions can be used individually or in a series as pre-class quizzes, in-class clicker questions or activities, post-class homework, or exams. When used in sequence, Progressions provide a connected learning path for students.

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