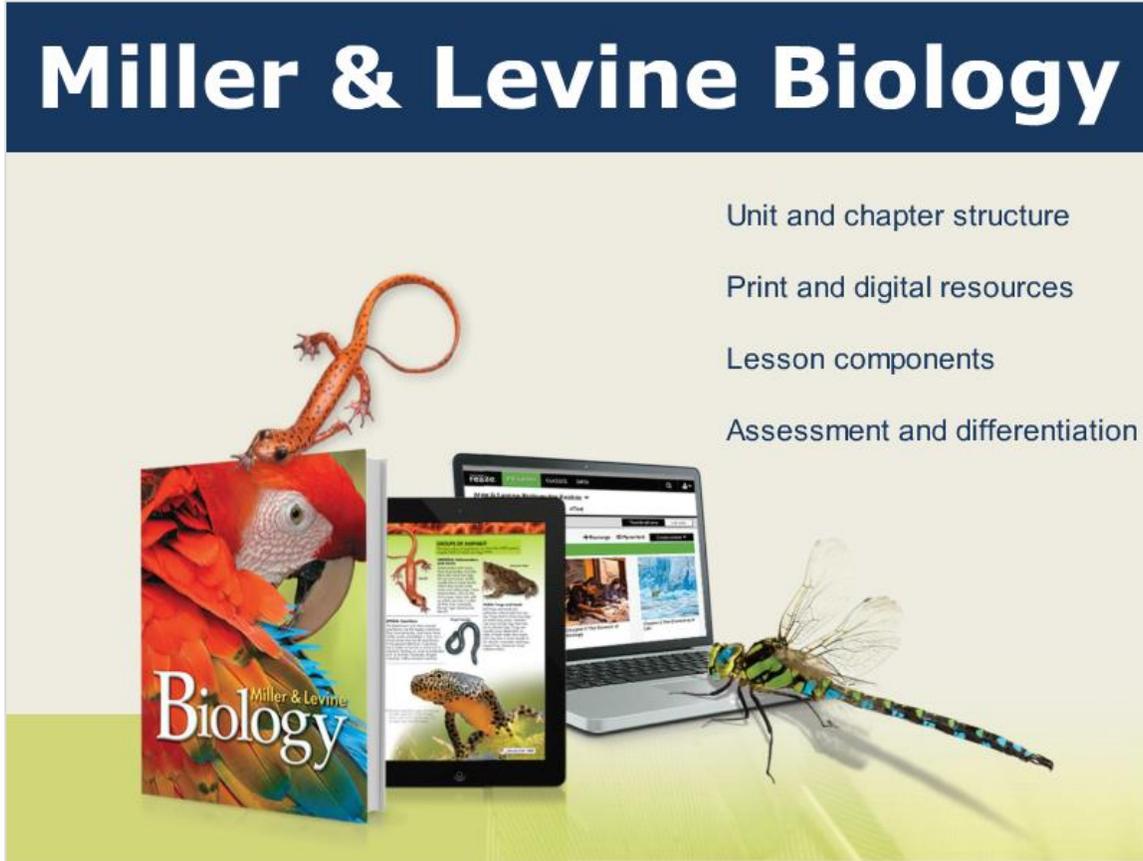


Miller & Levine Biology Program Overview

Introduction



The graphic features a dark blue header with the text "Miller & Levine Biology" in white. Below the header, on a light green background, are a book cover, a tablet, a laptop, and a dragonfly. The book cover shows a parrot and the text "Miller & Levine Biology". The tablet and laptop display biological content. The dragonfly is positioned to the right of the devices.

Miller & Levine Biology

- Unit and chapter structure
- Print and digital resources
- Lesson components
- Assessment and differentiation

Welcome to My Pearson Training. In this tutorial, we will explore the features of *Miller & Levine Biology*.

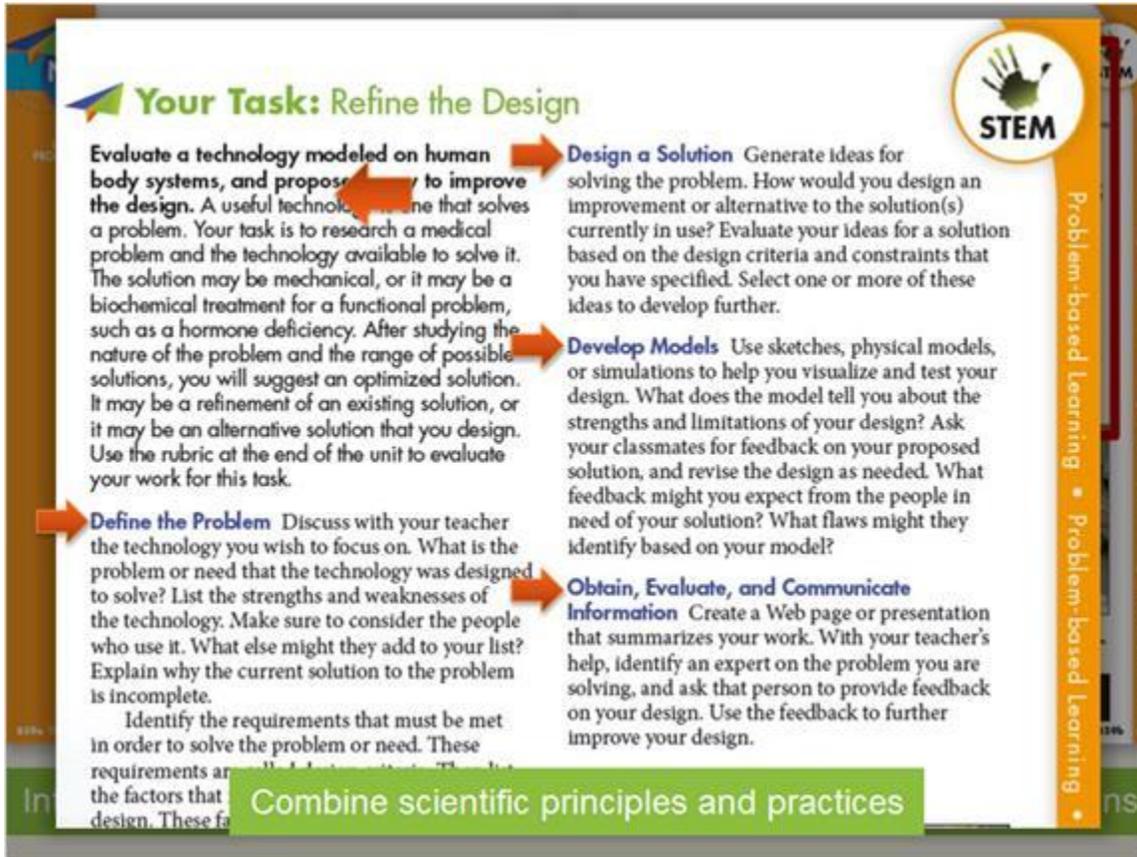
Miller & Levine Biology offers an exciting and unique approach to biology instruction. We will take a look at unit and chapter structure, print and digital program resources, lesson components, and assessment and differentiation features.

Unit and Chapter Overview



Miller & Levine Biology contains eight units, with a total of 35 chapters split across these units. The content is aligned with the Next Generation Science Standards, or NGSS.

Problem-Based Learning Project



Your Task: Refine the Design

STEM

Evaluate a technology modeled on human body systems, and propose a design to improve the design. A useful technology is one that solves a problem. Your task is to research a medical problem and the technology available to solve it. The solution may be mechanical, or it may be a biochemical treatment for a functional problem, such as a hormone deficiency. After studying the nature of the problem and the range of possible solutions, you will suggest an optimized solution. It may be a refinement of an existing solution, or it may be an alternative solution that you design. Use the rubric at the end of the unit to evaluate your work for this task.

Define the Problem Discuss with your teacher the technology you wish to focus on. What is the problem or need that the technology was designed to solve? List the strengths and weaknesses of the technology. Make sure to consider the people who use it. What else might they add to your list? Explain why the current solution to the problem is incomplete.

Identify the requirements that must be met in order to solve the problem or need. These requirements are all the things that the technology must do. List the factors that affect the design. These factors include the materials used, the cost of the technology, and the safety of the technology.

Design a Solution Generate ideas for solving the problem. How would you design an improvement or alternative to the solution(s) currently in use? Evaluate your ideas for a solution based on the design criteria and constraints that you have specified. Select one or more of these ideas to develop further.

Develop Models Use sketches, physical models, or simulations to help you visualize and test your design. What does the model tell you about the strengths and limitations of your design? Ask your classmates for feedback on your proposed solution, and revise the design as needed. What feedback might you expect from the people in need of your solution? What flaws might they identify based on your model?

Obtain, Evaluate, and Communicate Information Create a Web page or presentation that summarizes your work. With your teacher's help, identify an expert on the problem you are solving, and ask that person to provide feedback on your design. Use the feedback to further improve your design.

Combine scientific principles and practices

Problem-based Learning • Problem-based Learning

A key feature of each unit is the Problem-Based Learning Project which is introduced at the beginning of each unit. As students learn the unit's content, they will develop and refine their solutions to the unit problem. Students follow a series of steps to define the problem, design a solution, develop a model, and present their work.

In this project called "Body Mechanics," students begin by researching a medical problem and the technology available to solve it. In their solutions, they will combine biologic principles of medical technology with engineering and modeling practices to improve the technology.

Chapter Structure

10 Cell Growth and Division

Big idea Growth, Development, and Reproduction
Q: How does a cell produce a new cell?

CHAPTER MYSTERY
PET SHOP ACCIDENT

Julia stood in the salamander tank in horror. As an assistant in a pet shop, Julia had mistakenly put a small salamander in the same tank as a large one. Just as she realized her error, the large salamander attacked and bit off one of the small salamander's limbs.

Acting quickly, Julia scooped up the injured salamander and put it in its own tank. She was sure it would die before her shift ended. But she was wrong! Days passed... then weeks. Every time Julia checked on the salamander, she was more amazed at what she saw. How did the salamander's body react to losing a limb? As you read this chapter, look for clues to help you predict the salamander's fate. Think about the cell processes that would be involved. Then, solve the mystery.

Never Stop Exploring Your World.
Finding the solution to the Pet Shop mystery is only the beginning. Take a virtual field trip with the experts of *Untamed Science*™ to see where the mystery leads.

Untamed Science

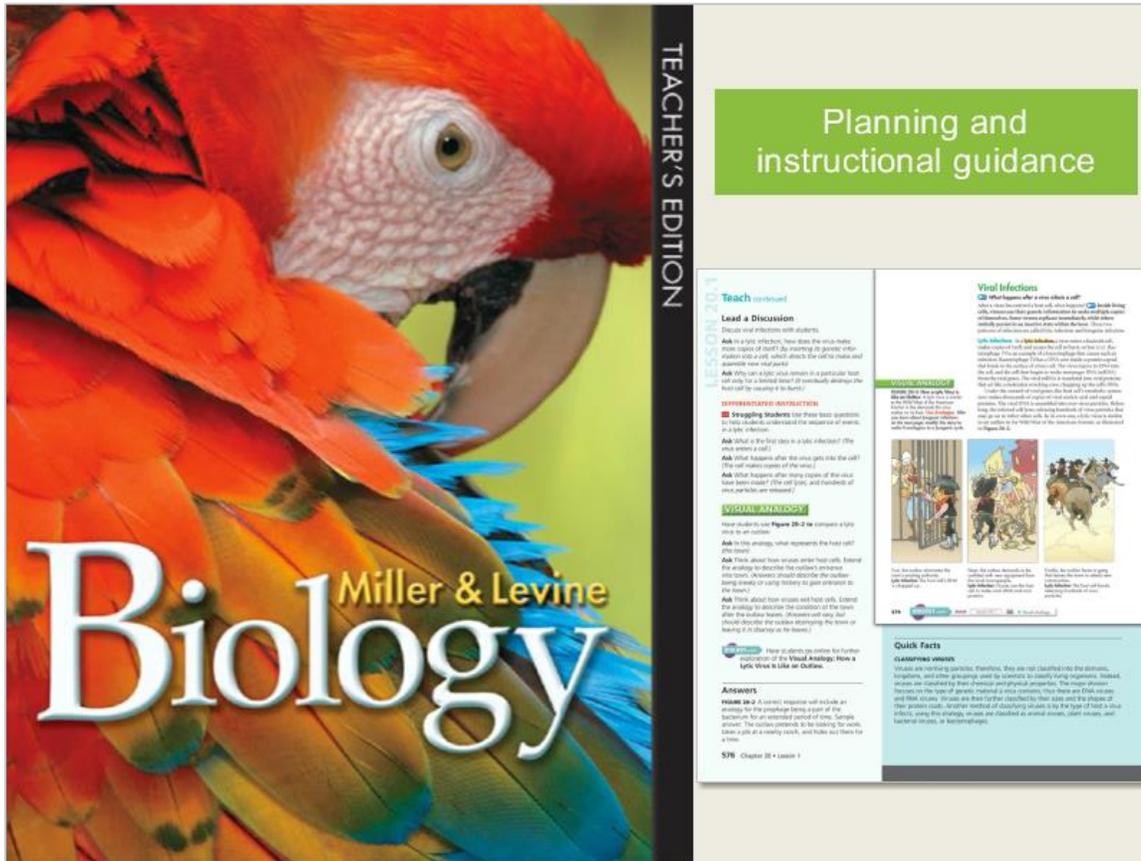
Cell Growth and Division 273

Help guide chapter inquiry

Real-world contexts for big ideas

Each chapter is organized around a “big idea” and a corresponding essential question to help guide the inquiry in the chapter. To kick off each chapter, students explore a “Chapter Mystery” which provides a real-world context for understanding the big idea. Students solve the mysteries using the principles they learn in the chapter. The mysteries require research and critical thinking to answer questions embedded in larger social contexts of biology. As students progress through the chapter, they will encounter clues to help them solve the mystery. In this Chapter Mystery, an accident occurs in a pet shop and students are left to uncover, “What happened to the salamander’s limb?”

Print Resources

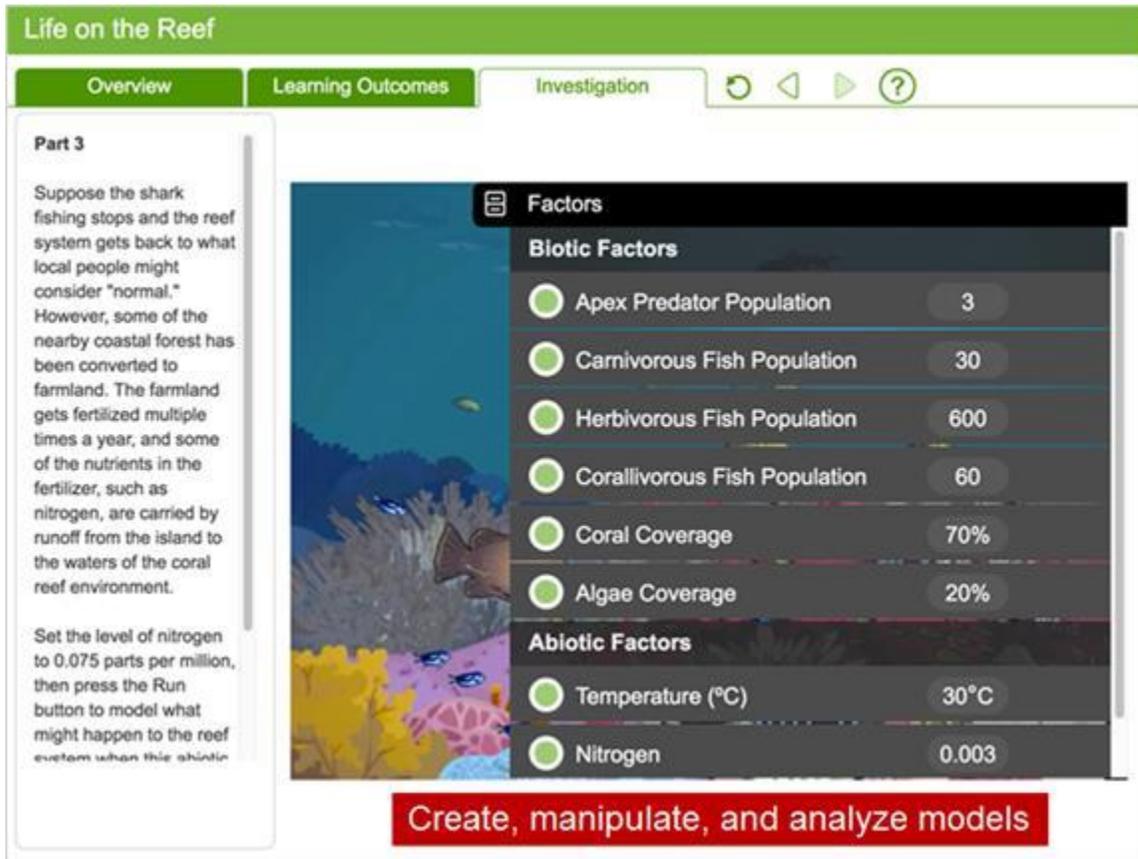


An important print resource is the Teacher’s Edition, which provides all of the planning and instructional guidance you’ll need to support your teaching and the needs of your classroom.

In addition, you can find all of the assessments you will use in the Assessment Resources companion.

Your students will use several print resources including the Student Edition, Study Workbooks, and Lab Manuals. You will have a Teacher’s Edition for each of the Study Workbooks and Lab Manuals.

Digital Resources



Life on the Reef

Overview Learning Outcomes Investigation

Part 3

Suppose the shark fishing stops and the reef system gets back to what local people might consider "normal." However, some of the nearby coastal forest has been converted to farmland. The farmland gets fertilized multiple times a year, and some of the nutrients in the fertilizer, such as nitrogen, are carried by runoff from the island to the waters of the coral reef environment.

Set the level of nitrogen to 0.075 parts per million, then press the Run button to model what might happen to the reef system when this change

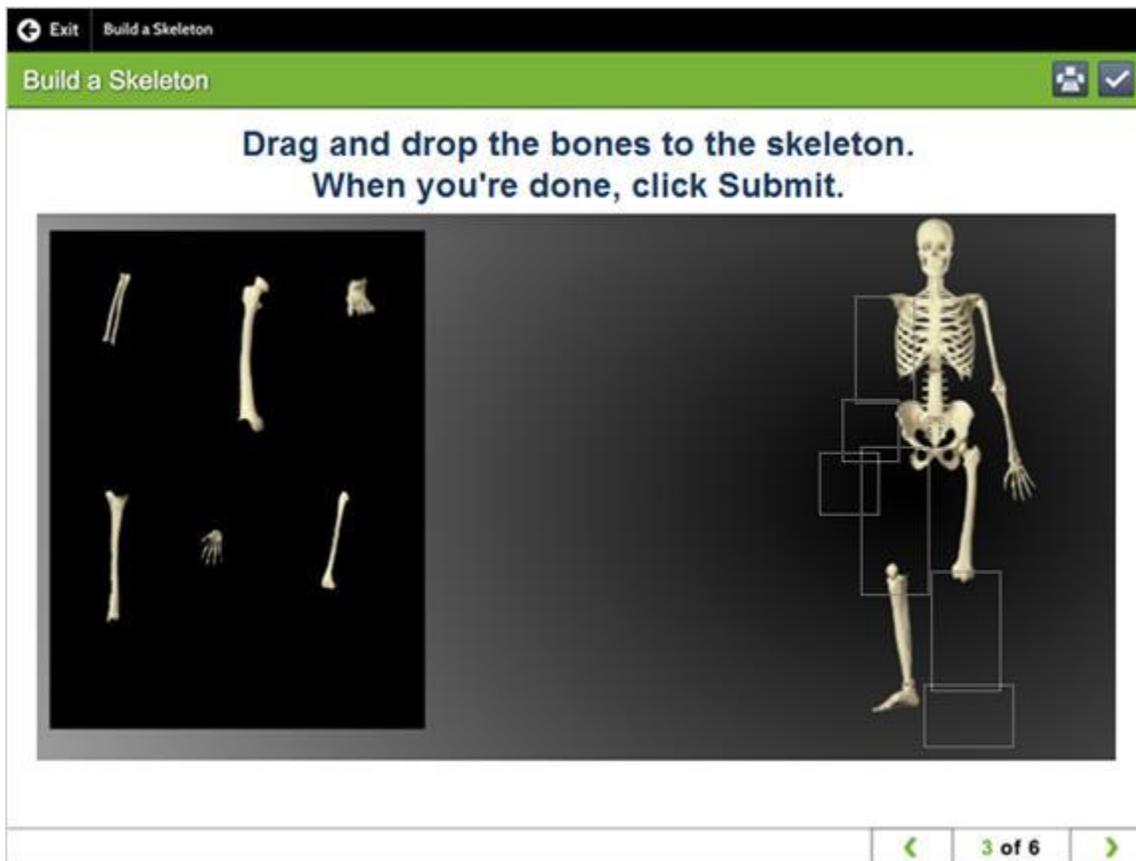
Factors

| Biotic Factors | |
|-------------------------------|-------|
| Apex Predator Population | 3 |
| Carnivorous Fish Population | 30 |
| Herbivorous Fish Population | 600 |
| Corallivorous Fish Population | 60 |
| Coral Coverage | 70% |
| Algae Coverage | 20% |
| Abiotic Factors | |
| Temperature (°C) | 30°C |
| Nitrogen | 0.003 |

Create, manipulate, and analyze models

All of your digital resources are contained online on Pearson Realize™. You and your students will find exciting interactive features, like Untamed Science™ Videos, Flipped Videos for Science™, discussion boards, and Virtual Labs. The Virtual Lab is an exciting new feature that allows students to create, manipulate, and analyze models to understand the relationships in complex systems.

Interactive Exercise: Virtual Activities



You can look at virtual activities like the one above on Pearson Realize.

eTexts

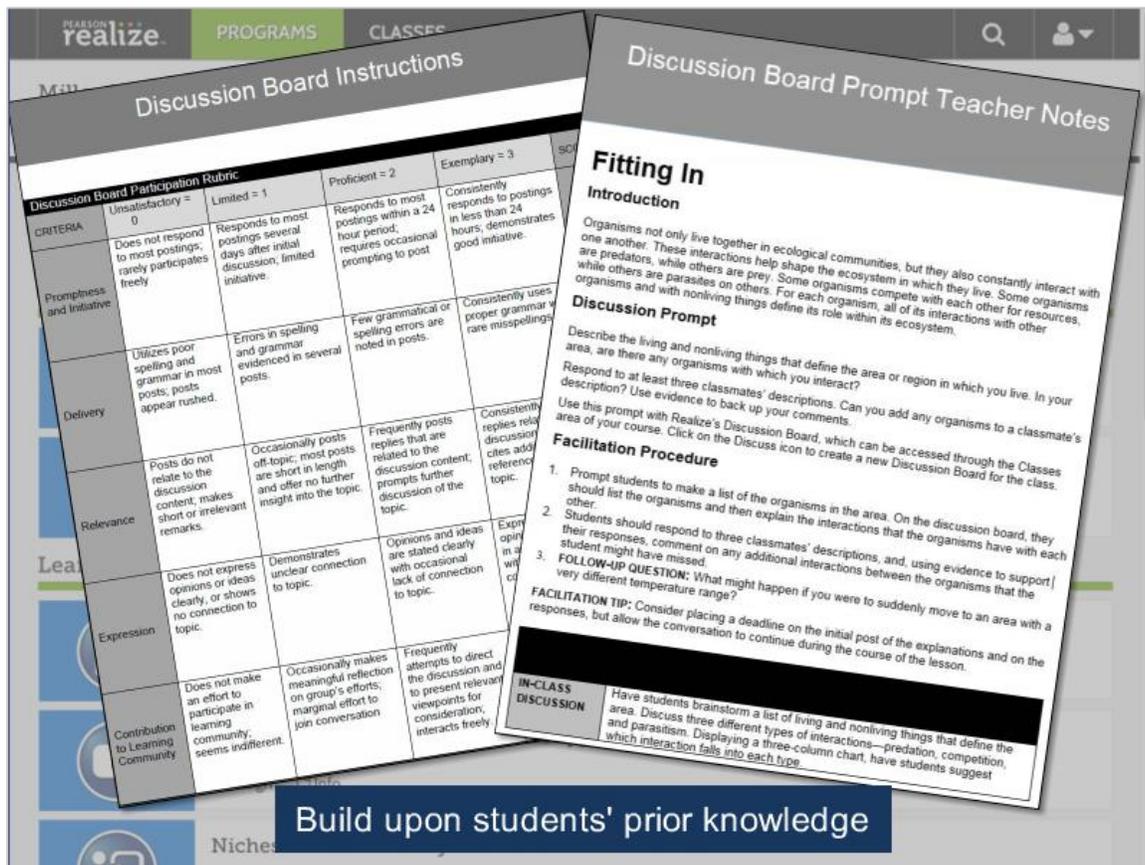
The screenshot shows the Pearson Realize eText interface for Lesson 1.1, "What Is Science?". The interface is divided into several sections:

- Navigation Sidebar (Left):** Includes "Table of Contents" with a "Biology" folder, "Lessons", "Activities", "Labs", and "Assessments". Under "Assessments", there are units for Ecology, Cells, Genetics, Evolution, and From Microorganisms to Plants.
- Lesson Header:** "PEARSON" logo, "Welcome Erin Pfaff", "Bookshelf", "Settings", "Help", and "Sign Out".
- Lesson Content:**
 - Getting Started:** Objectives (1.1.1 State the goals of science, 1.1.2 Describe the steps used in scientific methodology).
 - Student Resources:** Study Workbooks A and B, Spanish Study Workbook, Lab Manual B, and a link to "Biology.com" for Lesson Overview and Lesson Notes.
 - Activate Prior Knowledge:** A task where students write the title of Lesson 1.1 on the board and discuss their responses.
 - Teach for Understanding:** Includes "Enduring Understanding" (The process of science helps biologists investigate how nature works at all levels...), "Guiding Question" (How do we find explanations for events in the natural world?), and "Evidence of Understanding" (After completing the lesson, give students the following assessment...).
- Visuals:** A large image of a biologist in a field, and a smaller image of a parrot in the top left corner.

You can find all of your print resources online as well. eTexts are available for both you and your students on Pearson Realize. Here you'll find digital versions of lessons, activities, and printable labs and assessments.

Within your Teacher's Edition eText, you can search for content by keyword, add notes and bookmarks, and edit lesson presentations.

Lesson Components



The screenshot displays two overlapping documents from the Pearson Realize platform. The background document is the 'Discussion Board Participation Rubric', which is a table with columns for 'Unsatisfactory = 0', 'Limited = 1', 'Proficient = 2', and 'Exemplary = 3'. The rows list criteria such as 'Promptness and Initiative', 'Delivery', 'Relevance', 'Expression', and 'Contribution to Learning Community'. The foreground document is the 'Discussion Board Prompt Teacher Notes' for the topic 'Fitting In'. It includes an 'Introduction' about ecological communities, a 'Discussion Prompt' asking students to describe living and nonliving things in their area, and a 'Facilitation Procedure' with three numbered steps. An 'IN-CLASS DISCUSSION' box at the bottom of the notes suggests a three-column chart for classifying interactions.

| CRITERIA | Unsatisfactory = 0 | Limited = 1 | Proficient = 2 | Exemplary = 3 |
|------------------------------------|---|---|---|--|
| Promptness and Initiative | Does not respond to most postings; rarely participates freely | Responds to most postings several days after initial discussion; limited initiative. | Responds to most postings within a 24 hour period; requires occasional prompting to post | Consistently responds to postings in less than 24 hours; demonstrates good initiative. |
| Delivery | Utilizes poor spelling and grammar in most posts; posts appear rushed. | Errors in spelling and grammar evidenced in several posts. | Few grammatical or spelling errors are noted in posts. | Consistently uses proper grammar; rare misspellings |
| Relevance | Posts do not relate to the discussion content; makes short or irrelevant remarks. | Occasionally posts off-topic; most posts are short in length and offer no further insight into the topic. | Frequently posts replies that are related to the discussion content; prompts further discussion of the topic. | Consistently replies relevant to discussion; cites additional references to topic. |
| Expression | Does not express opinions or ideas clearly, or shows no connection to topic. | Demonstrates unclear connection to topic. | Opinions and ideas are stated clearly with occasional lack of connection to topic. | Expresses opinions in a well-organized manner |
| Contribution to Learning Community | Does not make an effort to participate in learning community; seems indifferent. | Occasionally makes meaningful reflection on group's efforts; marginal effort to join conversation | Frequently attempts to direct the discussion and to present relevant viewpoints for consideration; interacts freely | |

Discussion Board Prompt Teacher Notes

Fitting In

Introduction

Organisms not only live together in ecological communities, but they also constantly interact with one another. These interactions help shape the ecosystem in which they live. Some organisms are predators, while others are prey. Some organisms compete with each other for resources, while others are parasites on others. For each organism, all of its interactions with other organisms and with nonliving things define its role within its ecosystem.

Discussion Prompt

Describe the living and nonliving things that define the area or region in which you live. In your area, are there any organisms with which you interact?
Respond to at least three classmates' descriptions. Can you add any organisms to a classmate's description? Use evidence to back up your comments.

Use this prompt with Realize's Discussion Board, which can be accessed through the Classes area of your course. Click on the Discuss icon to create a new Discussion Board for the class.

Facilitation Procedure

1. Prompt students to make a list of the organisms in the area. On the discussion board, they should list the organisms and then explain the interactions that the organisms have with each other.
2. Students should respond to three classmates' descriptions, and, using evidence to support their responses, comment on any additional interactions between the organisms that the student might have missed.
3. **FOLLOW-UP QUESTION:** What might happen if you were to suddenly move to an area with a very different temperature range?

FACILITATION TIP: Consider placing a deadline on the initial post of the explanations and on the responses, but allow the conversation to continue during the course of the lesson.

IN-CLASS DISCUSSION Have students transform a list of living and nonliving things that define the area. Discuss three different types of interactions—predation, competition, and parasitism. Displaying a three-column chart, have students suggest which interaction falls into each type.

Build upon students' prior knowledge

Each lesson begins with a section called “Getting Started,” which contains a discussion board prompt, complete with a rubric and in-class discussion questions. These discussions will reveal and build upon students’ prior knowledge about the focal concepts for the lesson.

The “Teach” section, called “Learn” on Pearson Realize, contains a number of activities like lesson presentations, videos, and labs. This section always ends with assignments from Study Workbooks A and B.

Finally, the “Assess” section provides a quiz that students can take in print or online through Pearson Realize. The digital version is auto-graded to save you time and help guide your instructional decisions more efficiently by providing instant access to student and class data.

The Diversity of Life Appendix



A Visual Guide to The Diversity of Life

HOW TO USE THIS GUIDE

Use this visual reference tool to explore the classification and characteristics of organisms, including their habitats, ecology, behavior, and other important facts. This guide reflects the latest understandings about phylogenetic relationships within the three domains of life. Divided into an individual section, the Visual Guide begins with a brief survey through the history and key concepts. It next discusses the major groups of plants, fungi, and animals. The final section provides information on nine natural topics.

- 1. See how the groups of organisms relate to others on the tree of life.
- 2. Learn about the general characteristics for all members of the group.
- 3. Discover the members of the group and how they fit in.

Investigate current news and emerging facts about the group.

See photographs of representative members within each group.

Archaea

KEY CHARACTERISTICS

Hot Enough for You?

Hot Enough for You?

Ecology

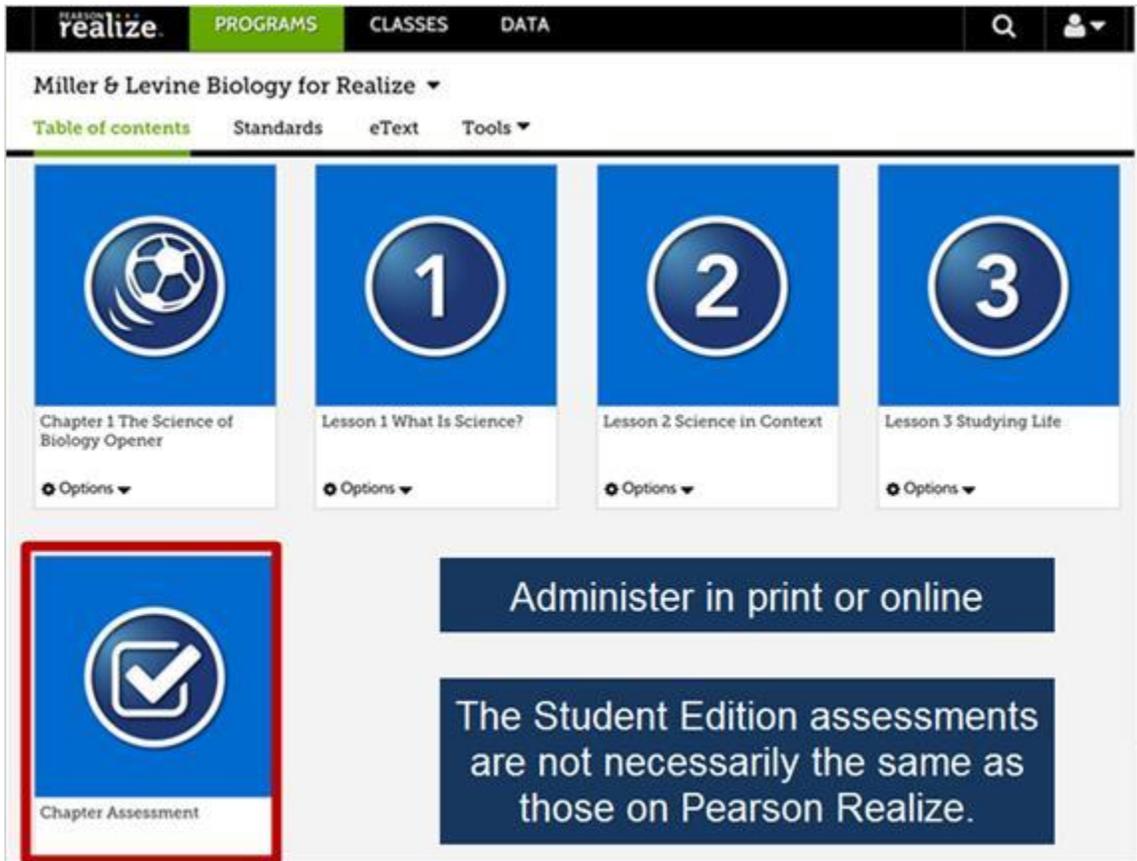
Behavior

Habitats

Explore the classification and characteristics of organisms

The *Diversity of Life* appendix is a visual reference tool designed to help students explore the classification and characteristics of organisms, including their ecology, behavior, and habitats. This resource reflects the latest understandings about phylogenetic relationships within the three domains of life. This resource is available both in print and as a downloadable PDF on Pearson Realize.

Assessment



Next, we will review the assessment features in *Miller & Levine Biology*. Begin by assessing your students' prior knowledge of both biology concepts and scientific practices using the two diagnostic tests on Pearson Realize. These assessments will help guide your instruction during the course.

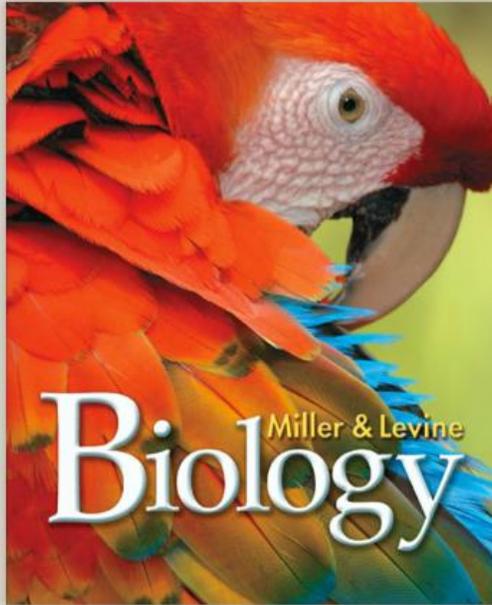
In addition, ongoing formative assessment is built into each lesson. Quick formative assessment opportunities are available at point-of-use on Pearson Realize and within your Teacher's Edition.

Use the benchmark tests to monitor your students' progress toward success on high-stakes tests. Click **Info** under each test for more information including guidance on when to assign the test to your students.

In addition to the quizzes in each lesson, you will also find a test at the end of each chapter that you can administer in print or online. Note that the assessments in the Student Edition are not necessarily the same as those on Pearson Realize.

Closing

Miller & Levine Biology



Program features and materials

Pearson Realize

Assessment and differentiation



In this tutorial, we examined the key program features and materials of *Miller & Levine Biology 2014*. We looked at the Pearson Realize platform, which houses all digital resources. We also learned about assessment and differentiation resources embedded within the program.

For additional *Miller & Levine Biology* resources visit MyPearsonTraining.com.