



On-Level Student Edition

Introduction

This guide walks through the student textbook for the On-Level Edition of 2010 Miller & Levine Biology. It looks at the table of contents and the learning features and resources within a chapter, and it explores some of the assessment options available to students. Notice that the Student Edition pages are contained within the Teacher’s Edition.

Some people are already familiar with the Dragonfly or Elephant versions of the popular Miller & Levine Biology series. The 2010 edition is a totally new version of the series. There are many differences between this new program and the ones that were used in the past. One difference is the arrangement and chronology of certain subjects. In the new program, each chapter is developed around a Big Idea. This Big Idea is the unifying factor for all instruction and assessment for the chapter. Another major difference is the way that technology is integrated into the instruction through the brand-new Biology.com Web site.

Table of Contents

Look at the table of contents to see how the units and chapters are organized.

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There are eight units in the On-Level version of the Miller & Levine text. The program has been designed so that the most commonly covered national science standards are addressed at the beginning of the book. These standards are covered in the core of the textbook. This core is included in Units 1 through 5.

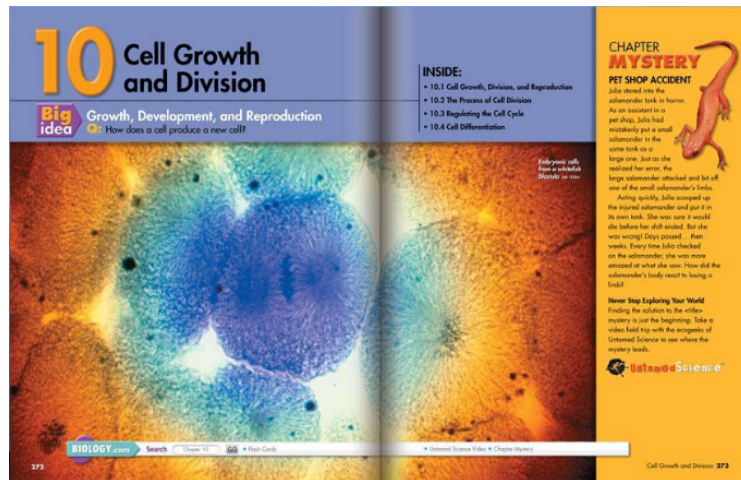
Each unit is broken down into two or more chapters. The Big Idea of each chapter is listed just below the chapter title. Lessons are listed immediately below the Big Idea. The title of the Chapter Mystery is

the last thing listed in the chapter. At the end of the unit there is a unit project.

At the back of the table of contents there are also listings for the Diversity of Life Visual Guide, Appendices, Labs and Activities, and other features.

Launching a Chapter

Each chapter begins with a chapter opener. This guide uses Chapter 10 as an example.



Chapter 10 is titled *Cell Growth and Division*. Each chapter has a Big Idea that is accompanied by a Big Question. These concepts are the foundation of the chapter. To the right of the Big Idea, the main concepts for the chapter lessons are listed.

Chapter Mystery

Each chapter begins with a Chapter Mystery. This mystery aligns to the Big Idea and concepts introduced in the chapter lessons. The Chapter Mystery for Chapter 10 is about Julia. She discovers that one of the limbs of a salamander have been eaten off. Concerned that the salamander might die, she places it in its own tank. She is surprised by the way the salamander's body reacts. Students are asked to determine how the body of the salamander might have reacted to the loss of a limb. Throughout the chapter, they're directed back to the Chapter Mystery, and they are introduced to clues that can help them solve the mystery by the end of the chapter.

They can also view the chapter mystery by visiting the suggested resources on Biology.com.

Lesson Features

The first lesson in Chapter 10 is Lesson 10.1: Cell Growth, Division, and Reproduction. Students are introduced to the Key Questions, lesson vocabulary, and a Taking Notes section. These are located in the left margin.

Key Questions

Key Questions are answered during the lesson wherever the key icon appears.

Vocabulary

The lesson vocabulary is called out for students through highlighted words in the text.

Taking Notes

Throughout the chapter, students are introduced to word study skills in the Build Vocabulary section. In this lesson, students are introduced to prefix meanings, but in other places in the program they are exposed to word origins or new academic words.

Students are alerted to various note-taking techniques. In this lesson, it's suggested that they write an outline, but notice that in other places in the program, students are encouraged to use two-column charts, concept maps, Venn diagrams, and other devices.

Visual Support

The Miller & Levine program uses a unique form of visual presentation called visual analogy. Visual analogies give a different perspective on content, connecting difficult concepts to real-world situations that students understand.

At the end of Lesson 10.2, there is another type of visual support called a *visual summary*. The goal of this graphic is to take a complex concept that was just covered in class and break it down visually.

Inquiry Opportunities

The program has a variety of inquiry opportunities. These range from open-ended activities where students design their own labs to guided inquiry where students address predetermined questions and follow a set of specific directions.

There are also activities that allow students to analyze and interpret data. In these activities, students are asked to make inferences about the presented data and predict outcomes.

Assessment

One important goal of the Miller & Levine program is that students become responsible for their own understanding. There are various ways in which students can monitor their own progress using the program tools.

Look at the assessment on the last page of Lesson 10.1. At the end of each lesson, there are section assessments that serve to monitor student understanding. These sections revisit the key concepts of the lesson, and in most cases they ask students to make a connection to another curricular area.

10.1 Assessment

Review Key Concepts

- a. Review** Identify two reasons why a cell's growth is limited.
- b. Explain** As a cell's size increases, what happens to the ratio of its surface area to its volume?
- c. Applying Concepts** Why is a cell's surface area-to-volume ratio important?

- a. Review** What is asexual reproduction? What is sexual reproduction?
- b. Explain** What types of organisms reproduce sexually?
- c. Summarize** What are the advantages and disadvantages of both asexual and sexual reproduction?

VISUAL THINKING MATH

3. The formula for finding the surface area of a sphere, such as a baseball or a basketball, is $A = 4\pi r^2$, where r is the radius. The formula for finding the volume of a sphere is $V = \frac{4}{3}\pi r^3$.

- Calculate** Calculate the surface area and the volume of the baseball and the basketball. Then, write the ratio of surface area to volume for each sphere.
- Infer** If the baseball and basketball were cells, which would possess a larger ratio of area of cell membrane to cell volume?

$r = 3.6 \text{ cm}$ $r = 12.2 \text{ cm}$

BIOLOGY.com Search Lesson 10.1 GO Self-Test Lesson Assessment

More assessment options are located at back of the chapter, including the Study Guide, chapter assessment, Standardized Test Prep, and Unit Project.

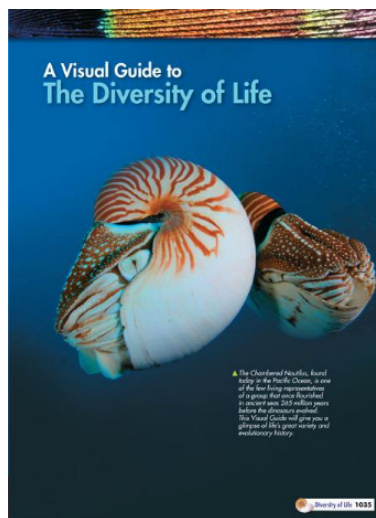
Students may use the Study Guide to review the key concepts or prepare for chapter tests. Chapter assessments come at the end of each chapter. Students are asked to review key concepts and think critically about what they learned.

Each chapter ends with Standardized Test Prep. These multiple choice questions help prepare students for state testing. Students having trouble answering questions may use the If You Have Trouble With section. This section directs them to the lesson sections that address the problem.

At the end of each unit is a Unit Project. The unit project is an open-ended authentic assessment. The assessment for Unit 3 involves students creating a comic book about a super hero cell.

A Visual Guide to: The Diversity of Life

At the back of the book, there are many resources that are available for students. Look at the section entitled *A Visual Guide to: The Diversity of Life*. Throughout the year, students may wish to use *A Visual Guide to: The Diversity of Life*. This easy-to-use guide addresses the latest understandings concerning phylogenetic relationships within the three domains of life.



Students use this reference tool to explore the classification and characteristics of organisms. Students may research the habitat, ecology, behavior, and other important facts about a variety of organisms. Students can see how the group of organisms relates to others on the tree of life diagram. Examining the key characteristics, students learn about the common characteristics shared by all group members. Students may then discover facts about specific organisms in the group. Current news and interesting facts are also provided to students. Finally, students may view exciting photographs that represent the organisms within each group.

Appendices and Glossary

Other reference tools are available at the back of the book. The appendices and glossary inform students about basic science skills, lab skills, technology and design, applicable math skills, and the periodic table. In addition, a bilingual English/Spanish glossary is provided.

Review

This guide walked through the Student Edition of the On-Level version of the Miller & Levine Biology textbook. It explored the unit and lesson structure using the table of contents and looked at the text features that help to launch a chapter. The guide also examined lesson features like key questions, vocabulary, taking notes, and visual analogies. It previewed various inquiry and assessment activities, and it briefly discussed the student reference materials located at the back of the student book.