



## On-Level: Making Content Comprehensible

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### Introduction

This guide looks at the features in the 2010 Miller and Levine Biology program that were included to help students increase their comprehension and understanding of key biology concepts. It examines these features in the student and Teacher Editions, Study Workbooks A and B, and in digital media available on Biology.com.

### Making It Personal

“There are several ways that we tried to make this book more accessible, and more entertaining, and more informative for your students, than ever before. One thing we have retained from previous versions of our books is the narrative style.

Students often come up to us and tell us that when they read this book they feel that we, as authors, are talking directly and personally to them, not at them, and certainly not down to them, but talking directly with them, as one person to another, sharing our insights and sharing some really cool stories about what biology is about and why it’s important.” —Joe Levine

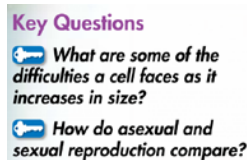
The biology content is available through four different versions of the program. The Comprehensive On-Level Edition, Core Edition, and Complete Digital Text share a set of similar comprehension tools and strategies. The Foundations Series has a slightly different set of comprehension tools for struggling learners, which can be seen in a separate tutorial on this Web site.

### Student Edition

Each lesson is introduced with the Key Questions, Vocabulary, and Taking Notes section.



Key Questions are introduced at the beginning of the lesson. As students read the text, they will see key icons that will lead them to the answers for these Key Questions.



Vocabulary terms are highlighted in yellow throughout the text.

Lessons feature a variety of note-taking strategies. Students use these strategies to organize information, compare concepts, sort characteristics, and clarify processes. Many of these strategies are explained in Appendix A in the Organizing Information section.

The authors of the program have included features that will increase the students' level of comprehension. As they go through the text and learn about complex processes, they will find text and graphic aides. They will also see analogies between complex concepts and situations that are familiar to them. Analogies are also used graphically in a feature called Visual Analogy.

Visual summaries also help take complex content and break it down into smaller and easier to understand visual representations.

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**Teacher Edition** Preparing students for reading the text is an important part of ensuring understanding. Begin each chapter with an activity to activate the students' prior knowledge or to build the students' backgrounds so they begin to make connections to the text.

**Activate Prior Knowledge**

Have students come to the board, one by one, and build a **Cluster Diagram** that incorporates all they can remember about cell growth. Encourage them to include diagrams when appropriate. Refer back to this diagram as you work through the lesson.

**Study Wkbs A/B**, Appendix S19, Cluster Diagram. **Transparencies**, G02.

If students are having difficulties grasping a concept, use the activities in the Differentiated Instruction sections.

**DIFFERENTIATED INSTRUCTION**

**Special Needs** Use clay models to help students understand that a smaller surface area to volume ratio does not mean the cube is getting smaller. Both surface area and cube volume increase as the length of the side increases.

**Struggling Students** Some students may have a difficult time understanding the information presented in the table. Point out that the cube directly above each column shows the "cell" that the calculations refer to. Then, explain that the first row shows how to find the surface area for each cubic "cell." Use a clay or plastic model of a cube to explain that, when students multiply length and width ( $l \times w$ ), they are finding the surface area of one face of the cube. They need to multiply this area by six, because the cube has six faces.

Possible student misconceptions are shown in the Address Misconceptions feature. This feature suggests activities or further discussions that will help clarify misconceptions.

**Address Misconceptions**

**Cell Growth** Students may think that cells get smaller and smaller with every successive cell division. Tell students that cells go through a period of growth after they divide. Remind students that cell division helps a cell avoid the problems of growing too large.

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**Biology Study Workbooks**

There are two study workbooks available for the Miller & Levine Biology program. Study Workbook A provides practice for on-level students. Struggling students will benefit from the strategies included in Study Workbook B.

In Study Workbook A, each chapter begins with a graphic organizer. Students will use this graphic to activate prior knowledge at the

beginning of the chapter and summarize what they have learned at the end of the chapter.

Notice the other helpful graphic organizers within the lesson in the section labeled Think Visually. These help students visually organize and review concepts that they have learned.

Workbook B offers students more support and explicit strategies. It is most often used with struggling readers, ELL students, or students that might just need an increased level of support.

Introduce a chapter with a pre-reading tool called Chapter Summary. The Chapter Summary concept map is the students' navigation guide through the entire chapter.

Throughout each lesson, introduce students to graphic organizers. These tools will help them reinforce content vocabulary, organize lesson information, and summarize key chapter concepts.

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**Biology.com**

There are quite a few activities available on Biology.com that are designed to help students build comprehension.

In addition to reading the Chapter Mystery in the textbook, the Chapter Mystery video is available to students. They will benefit from the additional visual and auditory experience.

Biology.com also features Untamed Science videos. These videos bring the biology concepts to life. The Ecogeeks introduce students to real situations that make the biology concepts concrete and help students increase their understanding.

Other activities help students solidify their understanding of the chapter vocabulary and organize what they have learned.

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**Review**

This guide explained the features of the Miller and Levine Biology text that are designed to help students increase their comprehension and understanding of key biology concepts. Students make personal connections to the biology material through the narrative text, realistic topics of the Chapter Mysteries, and visual and text analogies.

A number of graphic organizers are available in the text, in workbooks, and on Biology.com. These help your students organize what they have read, and learned.

The teacher's edition provides alternate strategies and activities that you can use to help your students increase comprehension.

And there are a variety of comprehension building activities and videos available on Biology.com.