Discovering Life Science

A complete textbook and a resource to integrate outlining

[Buyers: Contact me (at KWilhelmi@aol.com) to obtain free handwritten model outlines of the lessons.]

Format of the Textbook

Discovering Life Science is divided into ten units. Within a unit, there are 5 to 12 lessons - a total of 72 lessons. [The Table of Contents is provided at the end of this introduction.]

Each lesson is short. In most cases the content is covered in approximately 500 words. Including the diagrams and photos that appear on every page, the core information typically consumes two or three pages - an amount well suited to a single assignment.

All lessons follow the same format.

Lesson Title

The title is in the form of a question that focuses on the key objective. Students should be able to answer this question after completing the lesson. In addition, behavioral objectives are provided in the teacher's guide.

Exploring Science / Historical Steps

Following the title, there is a short story related to the lesson's topic. The story is designed to spark interest and encourage further reading. In most cases, this section incorporates a historically significant scientist or event. The scientists included are listed on the fourth page of this file. Note that this list includes historically famous people (such as Louis Pasteur and Edward Jenner), as well as people whose efforts have for too long been given inadequate credit (such as Angela Ferguson, Rachel Carson, and Charles Drew).

A secondary goal of the Exploring Science / Historical Steps section is to demonstrate that science material can be read simply for enjoyment. While this section introduces content that will be elaborated upon in the next part, it does so in a less formal style.

In most cases, this section closes with an inference question or a suggestion for further research. These are designated by a "➢".

Teachers may want to use this section to concentrate on students' reading skills. For example, students might be asked to share what key point is being made, what supporting information helped to make the story convincing, or what topic seems to be foreshadowed in the story.

Content

The key content of the lesson is introduced via a subtitle. Important words are printed in heavy type, and a pronunciation guide is provided (in parentheses) after the more difficult words.

To Do Yourself

Most lessons include a simple hands-on activity. While, as the title suggests, these are opportunities for individuals to delve deeper into a lesson's topic, they are based on labs that are commonly employed in life science courses. Nearly all of these investigations are safe for students to complete alone or in small groups, but a few require adult supervision. As shown on pages 5 and 6, the bulk of the materials are inexpensive, household items.. This guide provides suggestions for implementing each activity, and expected outcomes.

Lesson Reviews

The review material at the end of each lesson contains three or four parts, indicated by Roman numerals. Types of questions include fill-in-the-blanks, multiple choice, matching, arranging the steps of a process in the correct order, true/false (often with the requirement that false statements be corrected). A final question challenges the student to infer or to predict; this answer will require a complete sentence or two.

Unit Reviews

All units end with a review of the content, entitled **Review What You Know**. The unit review is divided into four parts. **Part A** reviews material in the unit in a motivational context. It is always a puzzle of some sort. **Part B** is a set of multiple-choice questions. **Part C** is visually oriented, focusing on student learning in a different modality. **Part D** consists of one or more projects that can be used to extend the unit or to challenge motivated students to deepen their understanding. Most of these projects could be used as group activities.

Teachers may find it useful to look at **Part D** before they begin a unit. In some cases, they may want students (or a select few students) to work on a project prior to or while the unit is being taught - and perhaps share what they've learned with the class. On the other hand, even completing a project long *after* a unit has been taught helps reinforce (or expand upon) key material.

Summing Up / Cumulative Reviews

Except for Unit 1, odd-numbered units are followed by a cumulative review. As with **Part C** of the unit reviews, the cumulative review relies largely on a visual modality.

In general, half or more of each review is concerned with the content of the previous two units, while the remaining parts of the review are on earlier units. Since there is a cumulative review every two units (starting with Unit 3), this plan ensures that all of the units are reviewed intensively. In all cases, the questions in **Summing Up** are keyed in this *Teacher's Guide* to the units that they cover.

Support for Thinking Skills

In addition to the strategies mentioned previously (the inference question at the end of each **Exploring Science / Historical Steps** section, the inference question at the end of each lesson's **Review**, and the **To Do Yourself** hands-on activities that challenge students to 'go deeper'), Lessons 2 and 3 of Unit 1 are devoted to the thinking strategies used by scientists. Unit 1 Lesson 2 (How Do Scientists Study Living Things?) focuses on the steps of the scientific method. In addition, students are introduced to the CER strategy (claim, evidence, reasoning) - a guideline for producing good conclusions. Unit 1 Lesson 3 (Ready For More Scientific Thinking?) describes the following: pattern recognition; inferring; incorporating controls; avoiding biases; and the role of verification.

Careers in Life Science

A careers page is provided after the first unit, and then after each even-numbered unit. These pages introduce careers that are related to that particular unit. At least two careers are presented on each page; the first career requires less preparation or training, while the others require more extensive education.

Format of the Teacher's Guide

The teacher's guide consists of twelve google doc files - the copyright page, this file introducing the textbook and teacher's guide, and one file for each of the book's ten units. Within each unit's file, the information appears lesson by lesson, using the same format as the textbook's lessons. There is one exception to the previous statement; for many of the lessons, I've added a section entitled **Reinforce / Enrich**. Here, I've provided links to videos and articles to support teachers. Why are some pages blank? Occasionally, on lessons (of this guide) that end near the bottom of a page, I've inserted a blank page in expectation of adding links later.

Videos

I used some of these videos during my career; most, I have located since retiring. I base my selection of videos entirely on the content of each video. I have not vetted the organizations or individuals behind each video, and I welcome feedback in this regard.

Most of the videos are intended to provide teachers with background information that is more advanced than would be shared with middle school students. Often, however, I've indicated specific segments that would be useful to show in class in order to reinforce the content of a lesson. Of course, anytime a video is to be shown in class it should first be previewed by the teacher.

While the videos come from a variety of people and organizations, teachers will notice that quite a few are from the following sources:

Crash Course With their rapid pace as well as their advanced content, these are usually better suited as tools for review by teachers or as enrichment opportunities for highly motivated students. Note: The Crash Course biology series is now produced in collaboration with the HHMI Biointeractive organization. Please note: On a few occasions the narrator makes a comment that many would consider "suggestive."

HHMI Biointeractive Videos from this organization often intersperse actual film with impressive graphics. A visit to their website is highly recommended.

Stated Clearly The name of this organization was well chosen! Their website states - "We produce animations on genetics, evolution, biology, and chemistry that are in line with NGSS standards for use in classrooms."
[For free guided questions for five of these videos, see my TPT store.]

Science Sauce The content, illustrations, and pace of these brief videos are often well matched with Discovering Life Science.

WARNING: Before displaying the opening scene of any YouTube video, make certain to expand the screen to full size. This will prevent showing students YouTube's "suggested videos" (commonly displayed at the right); these suggested videos sometimes have no connection to the chosen video and may even contain images or titles not intended for adolescents.