

Integrating Concepts in Biology (available from www.bio.davidson.edu/icb; © 2018 Trunity Digital Learning Solutions, ISBN: 978-1-63097-008-6)

The events of last winter and spring forced learning to move from the traditional classroom to more online opportunities. As this transition occurred, teachers and professors found themselves struggling to find resources that would support this unique method of instruction. Additionally, students had to adjust, switching from synchronous to asynchronous learning, and to having more of the responsibility for their own learning. Research has shown that when students construct their own knowledge and when new knowledge is connected to what they already know, they tend to retain more information.

A new online resource called *Integrating Concepts in Biology* (ICB) uses the latter two ideas as its guiding principles, presenting students with opportunities to analyze real data from primary literature as the framework for learning biology. These data revolve around the core concepts (“Big Ideas”) of quantitative reasoning, critical thinking, the ability to apply the process of science, and understanding the link between science and society. ICB is geared toward the beginning college biology course but is also usable by Advanced Placement students in high school (the focus on Big Ideas makes it likely to pass a course audit by the College Board).

This is not a typical online textbook (meaning it is not just a pdf file students read). ICB is totally interactive, with reading passages, embedded videos, online explorations, and review questions. One exciting aspect of these interactions is found in the

“Bio-Math” explorations. Here, students are presented with a data set and a live graph. Students can change the values of the data to observe how the graph changes in real time.

Like a typical biology text, ICB is arranged into different chapters, each of which starts with a table that shows its connection to the five Big Ideas (information, evolution, cells, emergent properties, and homeostasis). The biology learning objectives are outlined, followed by what students should learn in the Bio-Math explorations and the “Ethical, Legal, and Social Implications” section. Within the text, students are presented with real-world scenarios and data from the literature. After reading about the phenomenon, students are given a few integrating questions that relate directly to the reading and the data. These items ask students to analyze the graphs and charts they have just seen to synthesize the information and apply it to other situations. Each section of the book concludes with a list of the original sources the authors used to write the text so that students can learn more about the content. There is also a pop-up glossary of key terms.

Each chapter has an “Instructor Resources” section, in which the instructor can find formative assessment questions, premade PowerPoint slides, supplemental student resources, and a customizable test bank with answer key. The multiple-choice question pool is populated with data-driven items that encourage students to use their thinking skills. Instructors can select the particular items they want.

Integrated Concepts in Biology is currently available from the website given above. Professors and instructors can sign up for a free

review copy that is fully functional. Once adopted, the text is customizable to the professor’s class needs. Student pricing is currently \$90.00 for college students and \$45.00 for high school students. While this may seem steep (especially for high school students), financial hardship is considered, so contact the publisher. The book is entirely web-based and is viewable on all platforms, including tablets, phones, and laptops. Additionally, students can download a copy of the text to their tablets and take it home with them. The only problem with this is that they will not receive the live updates that are continually being done.

ICB provides an entire course in a single location. Because it provides everything an instructor needs, it reduces the amount of time spent on lesson preparation. Additionally, there are tools that allow instructors to flip their classroom and manage student learning. The course can be completely customized, changing the order of the chapters to best fit each class’s needs. Instructors can also create their own content.

Overall, ICB is an excellent online learning resource that will be an asset to basic college biology and AP Biology courses. Instructors will need to change their methods of delivery to have the students do more of the work, but once they adapt to that, they will never want to go back to their original way of teaching. ICB will become the new normal, especially for online learning.

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