Why Discovery Education Science Techbook is the Right Choice for Middle School Learners

Educators are faced with a number of pressing factors when they’re on the hunt for powerful middle school science resources. Will this support strong instruction? Will this be easy to use for my teachers? Will this comprehensively address the standards? And most importantly... Will this engage my students with relevant, high quality content that ignites a rigorous level of learning? The list of factors goes on, but it’s clear that the right resource has to build skills and elevate thinking in a way that really connects with middle school students.

Richard Elmore, Harvard University School of Education Anrig Research Professor of Educational Leadership, states,

“There are only three ways to improve student learning at scale: You can raise the level of the content that students are taught. You can increase the skill and knowledge that teachers bring to the teaching of that content. And you can increase the level of the students’ active learning of the content... That’s it. Everything that’s not in the instructional core can only affect student learning and performance by, in some way, influencing what goes on inside the core.”

Elmore indicates, “The instructional core is composed of the teacher and the student in the presence of content...It is the relationship between the teacher, the student, and the content.”

Because it impacts both what content students experience and how students interact with content, the selection of instructional resources has a major impact on the instructional core.

So what makes Discovery Education Techbook the right choice for middle school learners?

Science Techbook was designed

• To address the requirements of 21st-century science standards

• To make meaningful connections to the lives of middle school students

• To make it easy for busy middle school teachers to provide engaging and well-articulated learning experiences for students
How Science Techbook Meets the Requirements of 21st-Century Standards

Over the last three decades, educators, scientists, and researchers have learned a lot about how to teach science so that all children have the best opportunity to learn. This research was used to develop *A Framework for K-12 Science Education*, which then informed the development of the Next Generation Science Standards (NGSS). Whether a district has formally adopted NGSS or not, educators are looking for science instructional materials that make use of the most up-to-date research on how students learn science.

Science Techbook was developed from scratch to include topics that are relevant to middle school students and come to life through a student-centered instructional approach that promotes deeper science learning. In classrooms that use Science Techbook, learners engage in a wide variety of interactive and collaborative activities to build a deep understanding of the topics studied. Students then use their developing understanding of science to investigate problems and situations that connect to the everyday lives of middle school students. The middle school Science Techbook includes courses in Grades 6 to 8 Earth and Space Science, Grades 6 to 8 Life Science, and Grades 6 to 8 Physical Science.

Each course is built around three major dimensions:

- Scientific and engineering practices
- Crosscutting concepts that unify the study of science and engineering through their common application across fields
- Core ideas in four disciplinary areas: physical sciences, life sciences, earth and space sciences, and engineering, technology, and applications of science

As recommended in *A Framework for K-12 Science Education*, Science Techbook integrates engineering, technology, and applications of science with the other disciplinary topics.

Making Meaningful Connections to the Lives of Middle School Students

Science Techbook provides teachers with clear and specific examples that can be used to connect with the everyday lives of middle school students. Every model lesson includes a Teacher Preparation tab, which covers the following components:

- Prior Knowledge and Learning Progressions
- Common Misconceptions
- Connections to Students’ Lives

Learning In Action

In Connections to Students’ Lives, the authors of Science Techbook give teachers ideas for relating the science to the everyday experiences of students. For example, the middle school life science course includes a unit entitled “Cells.” One concept included in this unit is genes and mutations. The model lesson for this concept suggests relating this topic to students’ lives by having students think about their own DNA and how it might contain mutations. Students are informed that mutations happen all the time. While some are harmful, others are beneficial, and most have no impact on the life of the organism. This component ends with a brief description of what students will do as part of the lesson.
Every 5E lesson to the Connections to Students’ Lives section, every 5E lesson includes an Engage section as the first component of the lesson. In the Engage section of the lesson on genes, students are encouraged to think about traits they share with other humans and then traits they share with family members. Students are given a number of different real-world connections before they tackle a virtual lab in which they breed rabbits in an attempt to produce more offspring with specific characteristics.

**Supporting Teachers in Providing Engaging, Well-Articulated Learning Experiences**

Science Techbook includes a 5E model lesson for every concept in each unit. It also includes resources to help teachers understand the science concept for which the lesson was developed and grasp the prior knowledge that students may bring to the lesson. The Teacher Preparation component of the lesson always includes:

- Background for the Teacher
- Prior Knowledge and Learning Progressions
- Common Misconceptions

For example, middle school Earth and Space Science includes a unit entitled “The Earth–Sun–Moon System.” This unit includes three concepts with 5E model lessons for each concept: Rotation, Orbits, the Season, Phases and Eclipses.

Through a series of well-developed 5E lessons, students deepen their understanding of why we experience days, seasons, and years.

**Does Science Techbook Make a Difference in Student Learning?**

At Rock Hill Schools in South Carolina, 4th, 6th, and 7th grade students have excelled through their use of Discovery Education Science Techbook.

Results from the district’s research team, led by Dr. Harriet Jaworowski, show that students using Science Techbook scored higher on average in South Carolina’s 2015 Palmetto Assessment of State Standards (SCPASS) examination than their peers who were not taught with Science Techbook.