



Macmillan Learning Chemistry vs. OER: Your Guide to Understanding the Differences

Choosing the right course materials can be a challenging task. It requires striking a balance between high quality and affordability. Many instructors explore open educational resources (OER) as a potential solution. While OER can provide students with free textbooks, instructors often prefer the comprehensive nature of a complete course solution.

In this guide, we will delve into the distinctions between Macmillan Learning's course materials and OER, both of which are popular choices among chemistry educators.

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About OER

Open Educational Resources (OER) are teaching, learning, and research materials that are publicly available. They can be modified to meet anyone's needs and are usually offered at no or low-cost. While most OER are created by individual instructors and shared via online repositories, a handful of providers have created full-length OER textbooks.

OER have gained popularity in recent years due to their affordability and accessibility. However, the quality of OER can vary widely. While some resources are excellent, others may lack the rigorous editorial process needed to ensure reliability.

Macmillan Learning understands that high-quality content is the core piece of effective learning. Educators who want and value the following may find Macmillan Learning's offerings to be a more suitable option.

- Technology that helps students build skills, practice concepts and apply understanding to multi-concept problems.
- Time-saving tools for instructors that allow for greater focus on students' learning needs.

About Macmillan Learning

Macmillan Learning is committed to providing high-quality educational materials that empower both instructors and students. Macmillan Learning creates high-quality content and educational technology that enhances learning experiences and provides instructors with time-saving tools.

Achieve: The Learning Platform Designed to Strengthen Student Capabilities

While many OER resources focus solely on providing textbooks or text-based materials, Macmillan Learning goes above and beyond with its flagship courseware platform, Achieve. Achieve offers a range of tools that provide a space for supported practice and engaging study experiences.

Some key features of Achieve for Interactive General Chemistry, 2.0 include:

- **Diagnostic Tools to Address Learning Loss:** Achieve for Chemistry includes diagnostic tools, including the MUST baseline assessment and General Chemistry Readiness modules to help identify at-risk students and address learning gaps. Early identification of at-risk students provides an opportunity to intervene at the start of the term and direct resources and support to students who need it most. General Chemistry Readiness provides just-in-time review to bolster skills and get students up to speed quickly.
- **Interactive Video Activities** offer embedded pause points that serve as knowledge checks and opportunities for reflection. This transforms passive learning activities into immersive learning experiences. There are three popular types of videos available as interactive video activities:
 1. **Tutorial Videos:** These worked example videos were created exclusively for Interactive General Chemistry (IGC) by popular YouTube educator, Tyler DeWitt. They make chemistry concepts clear and understandable through the effective use of whiteboard videos.
 2. **Conceptual Videos:** These are the latest additions to the IGC multimedia library and feature presenters Tyler DeWitt and Jessica White. They are designed to help students grasp concepts, focusing less on procedures and problem-solving (which is the main focus of the Tutorial Videos).
 3. **Interactive Activities:** This section includes both PhET Simulations and Macmillan Interactives, providing a framework for students to explore and engage with these interactive learning tools.
- **Homework Problems:** Homework problems serve as a front door to learning. Students can either answer a question immediately or study further before answering by clicking on the Resources tab to go directly to the appropriate section in the e-book. Each problem provides help in the form of hints, targeted feedback and detailed solutions to ensure every problem provides learning through practice.
- **Interactives:** Worksheets utilize interactive simulations to provide an easy to implement problem solving activity for students to use in groups or individually—in-class or outside of class. Participation and reflection is encouraged with pre-built question decks and the included iClicker student app. OER often lacks these interactive assets.

Achieve Gives Instructors Time to Focus on What's Most Important: Teachers

Instructors today face increasing demands on their time and attention. While OER resources can be valuable, they often require additional effort from instructors both in vetting resources and creating supplemental materials. With Achieve, instructors not only have access to a buffet of resources, such as instructor tools for active learning and pre-built assessments, but they also benefit from time-saving features that have been created with their busy schedules in mind.

Key time-saving features of Achieve include:

- 1. Auto-graded assignments:** Achieve's auto grading feature streamlines the grading process, allowing instructors to provide timely feedback and assessment without the need for manual grading. This frees up valuable time that instructors can dedicate to engaging with their students.
- 2. LMS integration:** Achieve seamlessly integrates with Learning Management Systems (LMS), making it easy for instructors to manage their course materials and share student progress within their existing LMS platform.
- 3. Reporting & Insights:** Achieve provides instructors with helpful analytics on student performance and engagement. This data allows instructors to identify areas of improvement and tailor their teaching strategies accordingly.

When choosing between Macmillan Learning and OER for chemistry education, it's essential to consider the overall quality, comprehensive nature of the content, and the support offered for both instructors and students. While OER can offer affordability and easy access, the quality may vary. On the other hand, Macmillan Learning's Achieve provides a high-quality, holistic educational solution. It offers a robust learning platform designed to enhance students' learning experiences while also providing time-saving tools for instructors. This enables educators to focus on the most important aspect of teaching – the students. Macmillan Learning provides educators and learners with a comprehensive, quality-assured, and student-centric solution for chemistry courses.

Achieve: An Affordable Full Course Solution

	Macmillan Learning Achieve	Open Educational Resources
Content	Multimedia-rich e-book with a variety of high quality, vetted videos, animations and interactive media.	PDFs of OpenStax Texts and Libre Texts include links to YouTube videos.
Assessment	Pre-built assessment-- Adaptive Quizzes, Interactive Video Activities, Chapter Homework (ability to edit and customize); Practice Quizzes; ACS Practice Tests.	OpenStax partners with EdTech and Publishing companies. Libre recently released ADAPT to support some formative and summative assessment.
Student Engagement	A variety of multimedia and Pre-built in-class Activities— including interactive simulations with paired worksheets, iClicker Mobile Student app.	Partnership with EdTech and/or publishing companies required.





Achieve for Chemistry provides flexible tools and great content to teach the way you want, for your course, and with your students. This next-generation platform is fully mobile, intuitive, and easily integrated with your school's LMS if needed, for a seamless experience.

Readiness Toolbox

<p>Expressions</p> <ul style="list-style-type: none"> Simplifying Expressions Exponents and Exponent Laws Fraction Operations <p>Equations</p> <ul style="list-style-type: none"> Linear Equations Isolating an Unknown Solving Systems of Linear Equations Analytically and Graphically <p>Units & Measurements</p> <ul style="list-style-type: none"> SI Base and Derived Units Reading Measurements Unit Conversion 	<p>Reporting Measurements & Data</p> <ul style="list-style-type: none"> Significant Figures in Calculations Scientific Notation Mean and Median Linear Correlation in Scatterplots <p>Word Problems</p> <ul style="list-style-type: none"> Word Problem to Equation Direct Linear Variation Mixtures and Weighted Averages Choosing and Rearranging Formulae Using Units for Inference and Justification <p>Basic Chemistry</p> <ul style="list-style-type: none"> States of Matter Potential and Kinetic Energy Chemical Formulas
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Personalized Practice and Assessment

Chapter 8 Assignment Details: Target Score 450 pts, Topics 3. Assignment Completion: 30% (3/10). Performance Distribution: 100% (10/10) for 100% and up (0), 10-80% (0) for 10-80% (0), 0-10% (0) for 0-10% (0).

Name	Questions	Completion/Score
Maria Cruz	29	100% / 147
Rafael Escobar	25	100% / 482
Alex London	23	100% / 451
Luca Pellerin	28	100% / 529
Adam Smith	20	100% / 365

Activity Performance - All Students: Average Accuracy 73%. Performance Distribution: 83.3% for 83.3% Same Basics of Nucleotides and Nucleic Acids (59%), 72% for 83.3% Nucleic Acid Structure (72%), 87% for 83.3% & 8.4 Nucleic Acid Chemistry and Other Functions of Nucleotides (87%).

Goal Setting and Reflection Surveys

Intro to goal-setting and reflection:
This series of reflection surveys is aimed at helping you clarify your goals for this class, reflect on your progress, and identify your strengths and areas of growth as a student.

Being intentional about your goals for a course can help you better learn the material. Research has shown that having a goal that is focused on self-improvement and understanding leads to deeper learning than focusing on outperforming others or on normative grading standards.

Student-centered Study Resources

Sketch the valence orbitals in N_2 . Label the σ and π bonds.

FIGURE 11.28 Conceptual Video Tutorial: Visualizing Hybrid Orbitals (VOTF). You need to be online to access this video. This video demonstrates how to sketch the valence orbitals for a specific molecule.

Active Learning Resources with iClicker

The reactions of metals with acid are

A. decomposition reactions.
B. synthesis reactions.
C. single-displacement reactions.
D. double-displacement reactions.

Use bond enthalpies to estimate the enthalpy of reaction for

$$N_2 + 3H_2 \rightarrow 2NH_3$$

$$\Delta H_{rxn} = \sum(\Delta H \text{ bonds broken}) - \sum(\Delta H \text{ bonds formed})$$

$$\Delta H_{rxn} = [1(\Delta H_{N-N}) + 3(\Delta H_{H-H})] - [6(\Delta H_{N-H})]$$

$$\Delta H_{rxn} = [(1)(491 \text{ kJ}) + 3(436 \text{ kJ})] - [6(390 \text{ kJ})]$$

$$\Delta H_{rxn} = 2249 \text{ kJ} - 2340 \text{ kJ} = -91 \text{ kJ}$$

Learn more about Achieve for Chemistry

