



ACADEMIC SENATE FOR CALIFORNIA COMMUNITY COLLEGES

# Lessons from the Chemistry OERi Faculty Survey

November 17, 2022

# Welcome! Please introduce yourself in the chat

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- Why OER?
- Survey of chemistry faculty
- Making progress:
  - Open Organic Chemistry Texts
  - LibreTexts + ADAPT homework system
- Open Discussion



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Chemistry Discipline Lead  
College of the Canyons

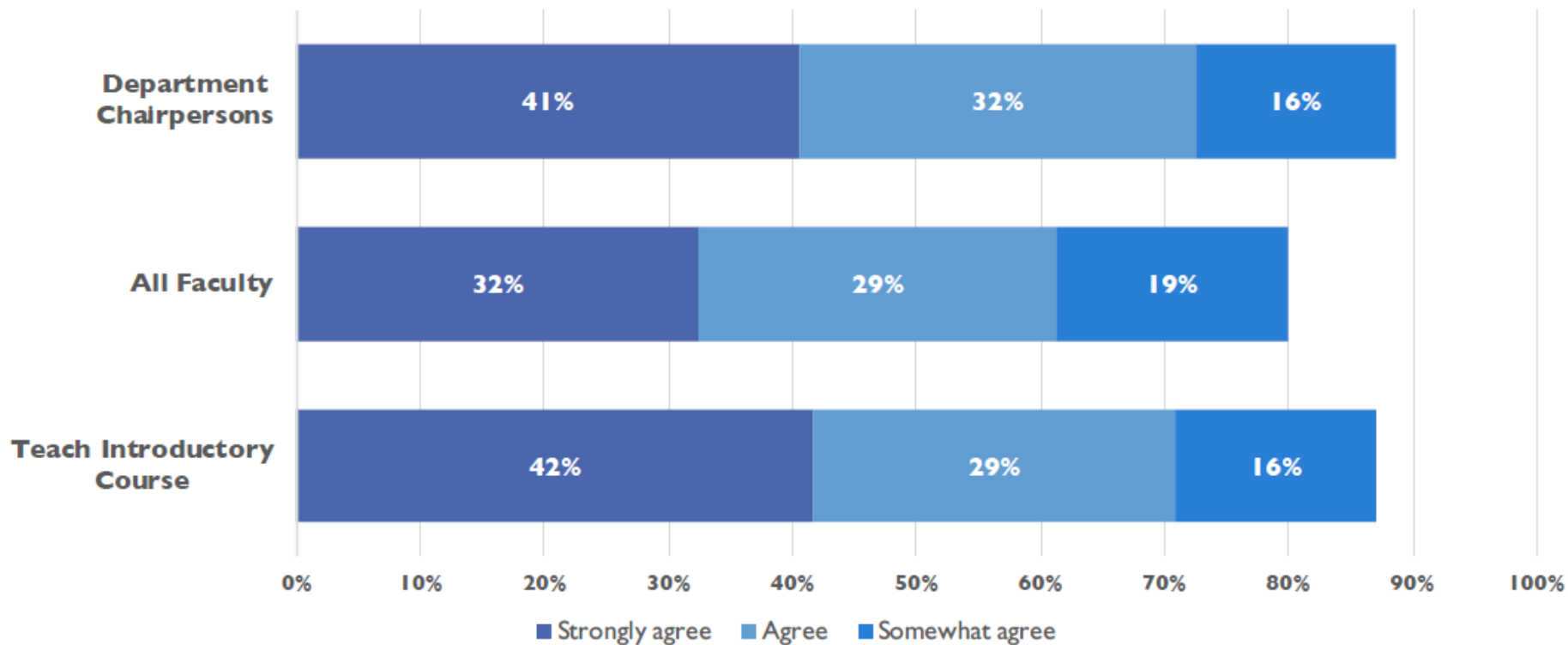
# What are Open Educational Resources?

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Creative Commons defines OER as teaching, learning, and research materials that are either (a) in the public domain or (b) licensed in a manner that provides everyone with free and perpetual permission to engage in the 5R activities— retaining, remixing, revising, reusing and redistributing the resources.

-- [Creative Commons](#)

## THE COST OF COURSE MATERIALS IS A SERIOUS PROBLEM FOR MY STUDENTS

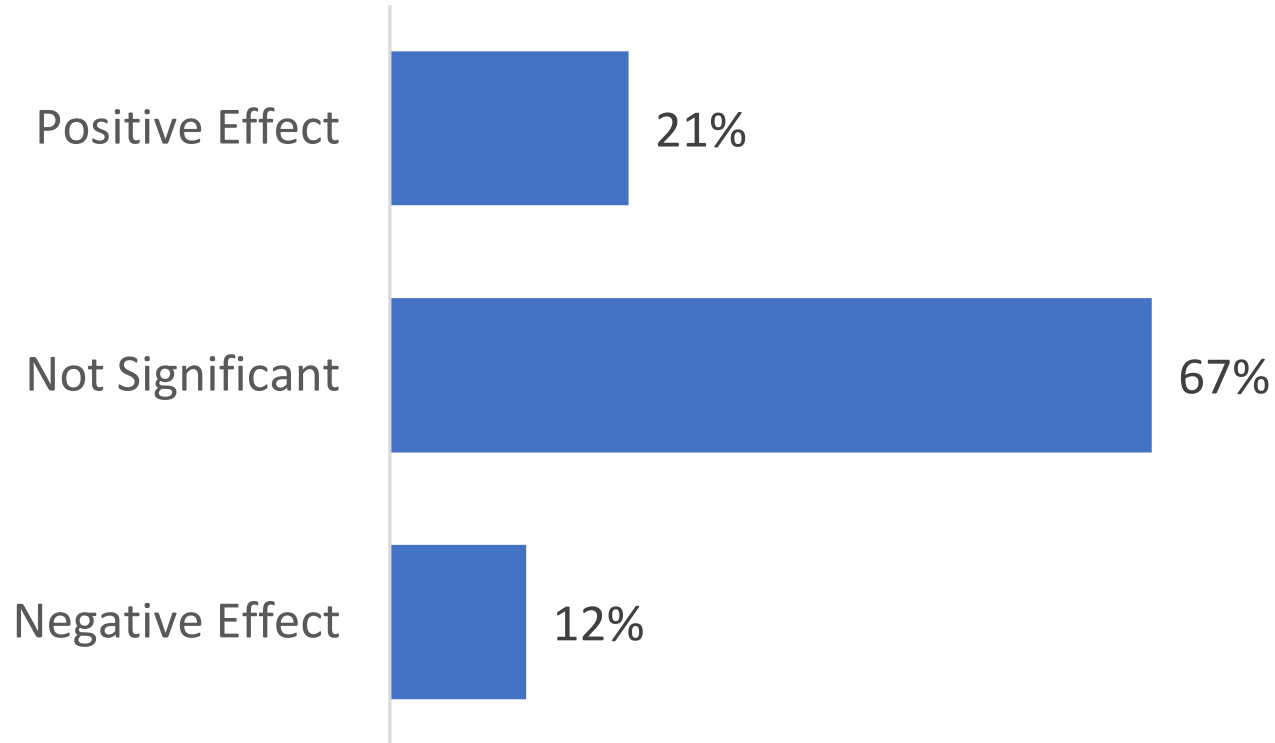


# How does OER benefit students?

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- Access to materials on Day 1 (and after course ends)
- Written with inclusiveness and diversity in mind/more diverse set of authors
- Content is adaptable to your class
- Can incorporate special topics, new and innovative applications/research

## Does using OER impact student learning?



# ZTC Degrees – the Motivation

- Students spend \$340/year on course materials<sup>1</sup>
- 66% of students avoid buying course materials due to steep prices<sup>2</sup>
- Pilot program: \$5 Million for planning and implementing ZTC pathways in California Community Colleges: 37 programs created<sup>3</sup>
- State allocated \$115 Million investment in developing ZTC pathways<sup>4</sup>



1. College Board, Trends in College Pricing and Student Aid 2022, Figure CP-1
2. Hanson, Melanie. “Average Cost of College Textbooks” EducationData.org, August 12, 2021
3. CCC Chancellor’s Office. “ZTC Degree Grant Program 2020 Legislative Report”
4. AB 132

# Chemistry Faculty Survey<sup>5</sup>

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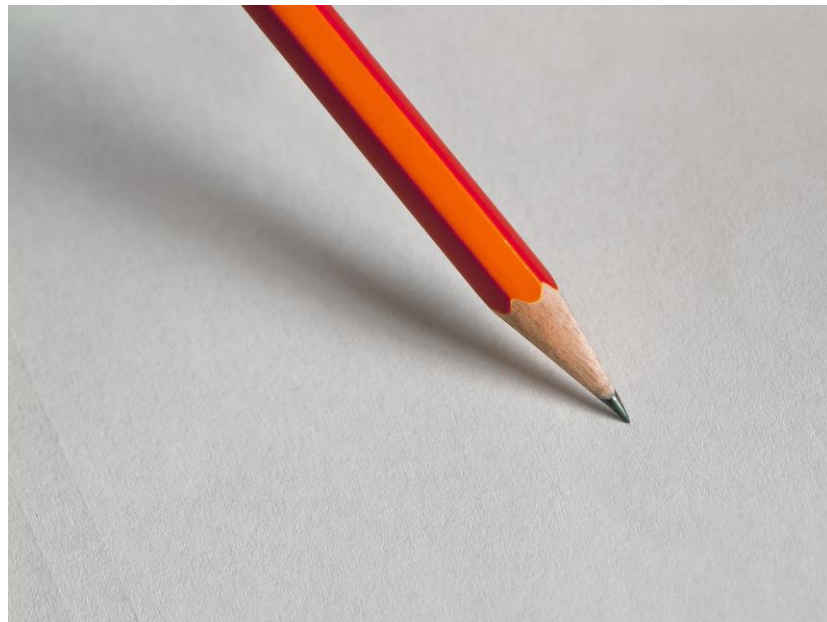
Faculty were surveyed in spring 2022 about their OER usage, perceptions, needs

**106 faculty respondents**

88% from CCC

49 CCCs represented

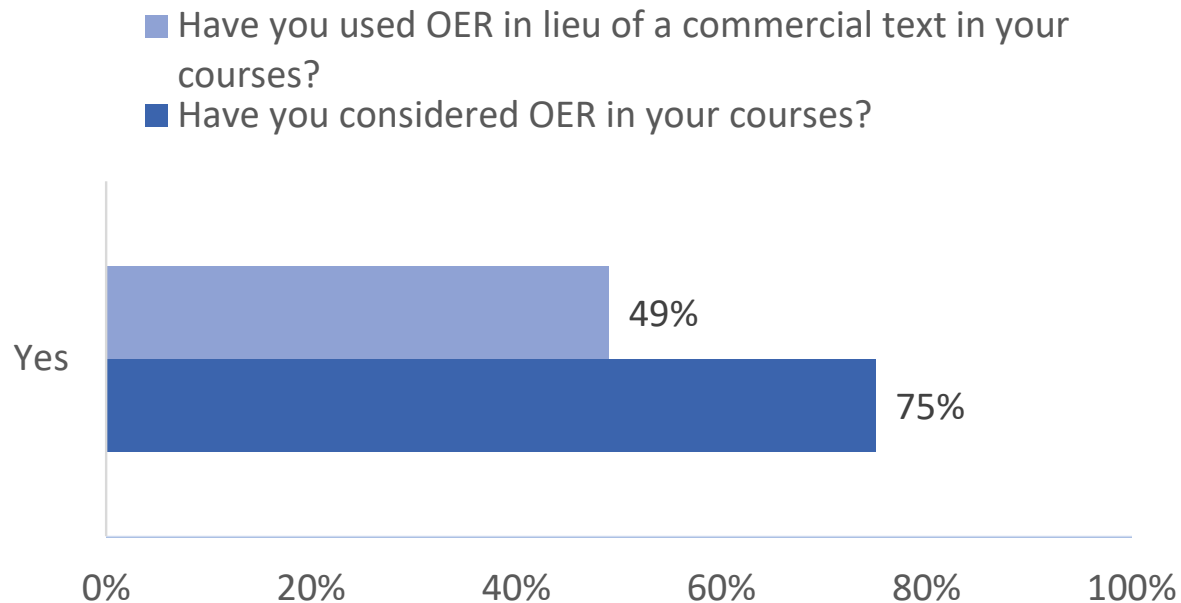
3 CSUs, 2 UCs, 1 private school





# Chemistry Faculty Survey

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## What course or courses were you considering OER and what resources, if any, did you find that might be useful?

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I use OER for General Chemistry. I would also like to use OER for Intro Chemistry or BOG Chemistry.

I've used the Openstax Chemistry 2e book for general chemistry

Chemistry for the Liberal Arts. No appropriate text was available.

I am considering using an OER textbook for my lab techniques text, and potentially to replace my ochem lecture textbook as well.

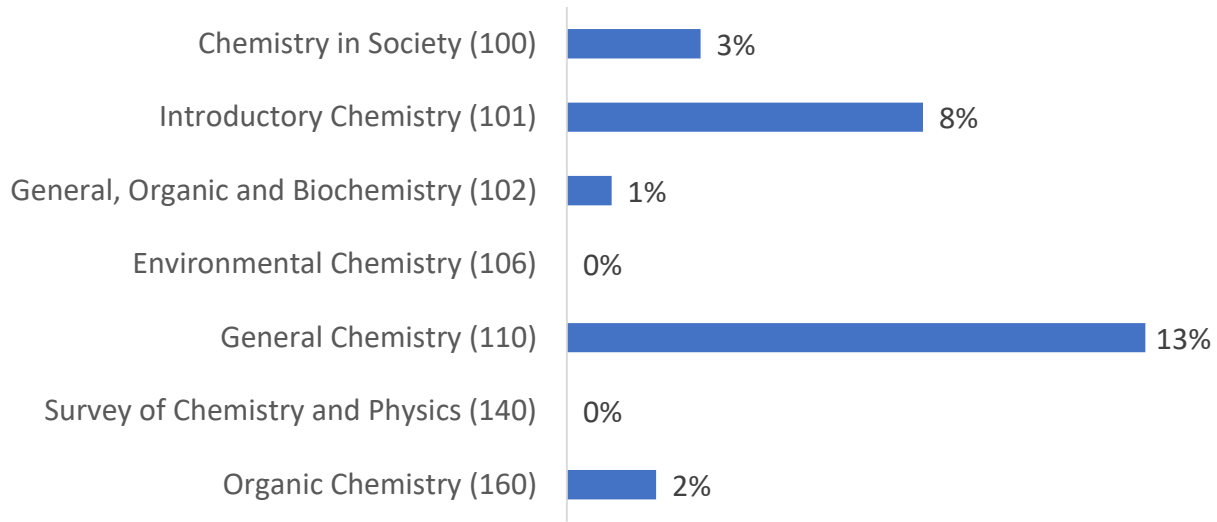
I would like to find OER suitable for a GOB course designed primarily for pre-nursing students

I am considering OER for Introductory Chemistry. My main issue is that students need a large database of practice problems

# Where is OER being used?

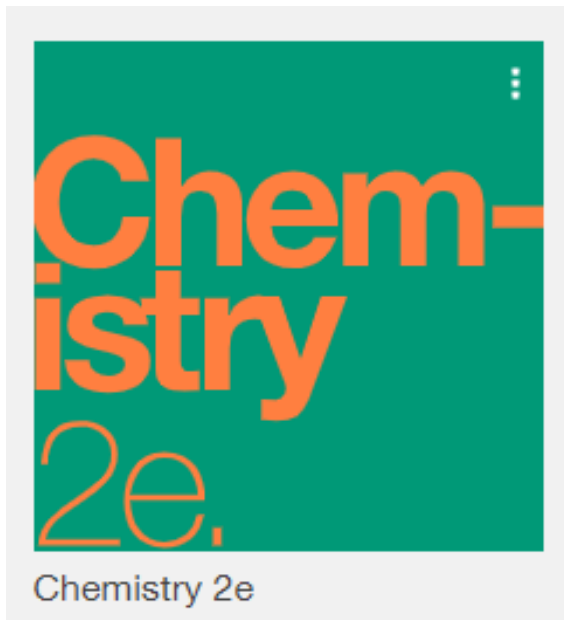
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OER Use by Course (C-ID)



## Most Used OERs

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Carnegie Mellon University

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**Open Learning** Initiative

Transforming higher education through the science of learning.

# OpenStax

Peer-reviewed, openly  
licensed textbooks

[www.openstax.org](http://www.openstax.org)



OpenStax Chemistry 2e has:

- Supplemental materials (Lecture PowerPoint Slides, Instructor Solutions Manual, Supplemental Test Items\*, Syllabus Language, Canvas Shell)
- Actively reviews reports of errata and corrects errors
- Partnerships with several 3<sup>rd</sup> party homework vendors



- Platform developed by Chemistry Faculty
- Goal is to provide free and evolving texts for students
- Able to use textbooks directly or 'remix' for your course

<https://chem.libretexts.org/>



Campus Bookshelves



Bookshelves



Learning Objects



## Open Learning Initiative

Transforming higher education through the science of learning.

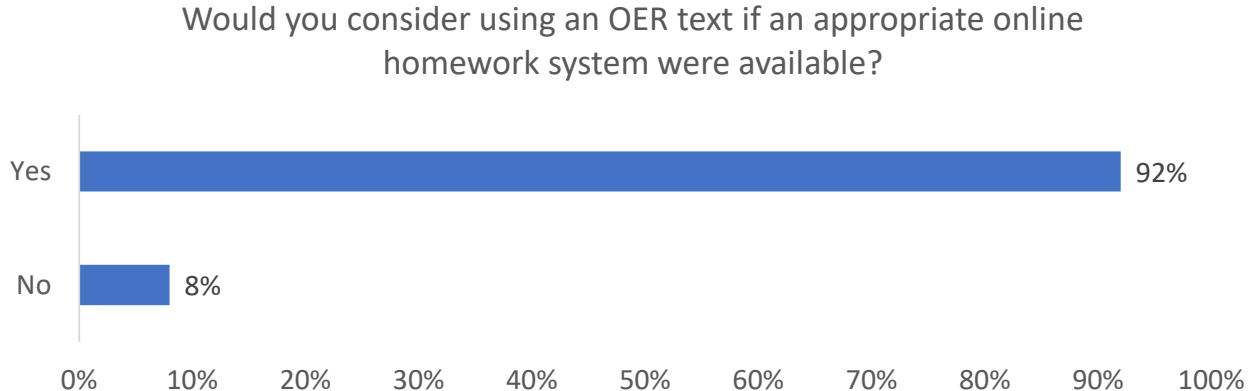
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- Includes readings, practice problems, PhET simulations, etc. to engage students in learning
- Organized into modules; similar to LMS structure
- Free and open, self-paced courses
- Instructor-led courses (~\$25/student)

# Barriers to OER Adoption

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- Lack of appropriate materials for the course
- No clear processes for maintaining, improving, updating existing OER
- Lack of additional support resources

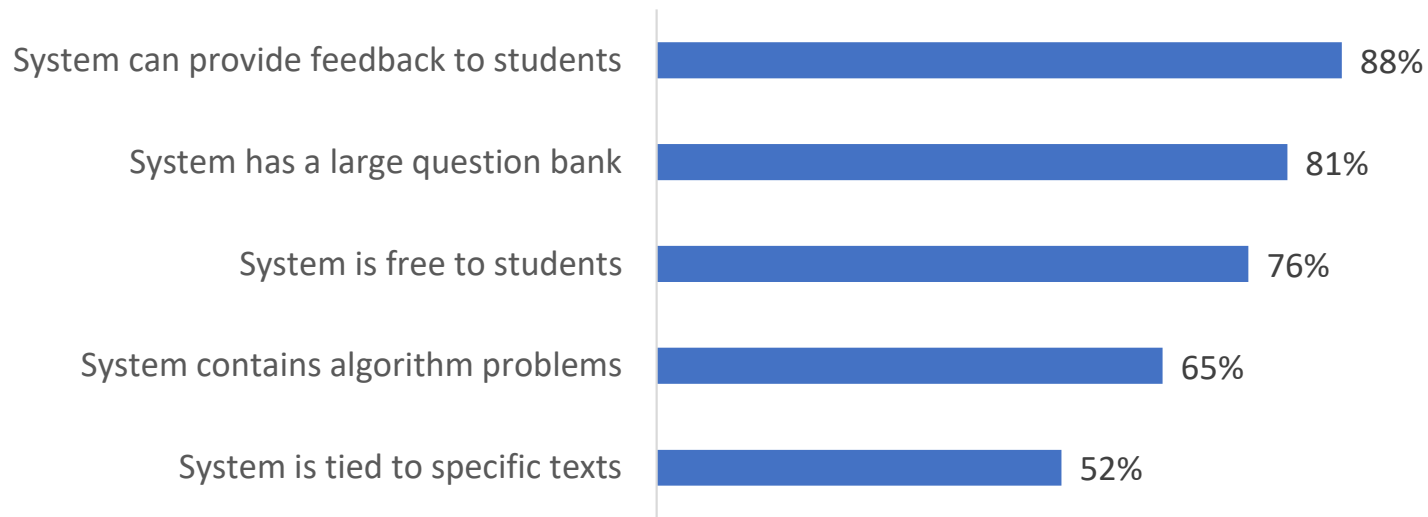




# Online Homework Systems for Chemistry

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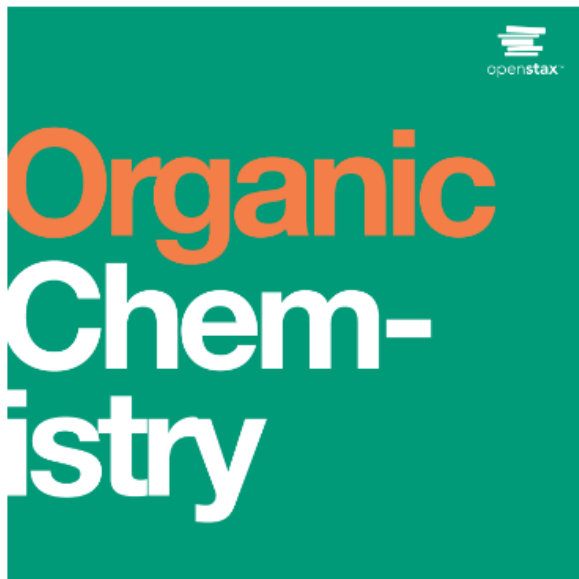
What features of an online homework system are important?



# New and upcoming resources



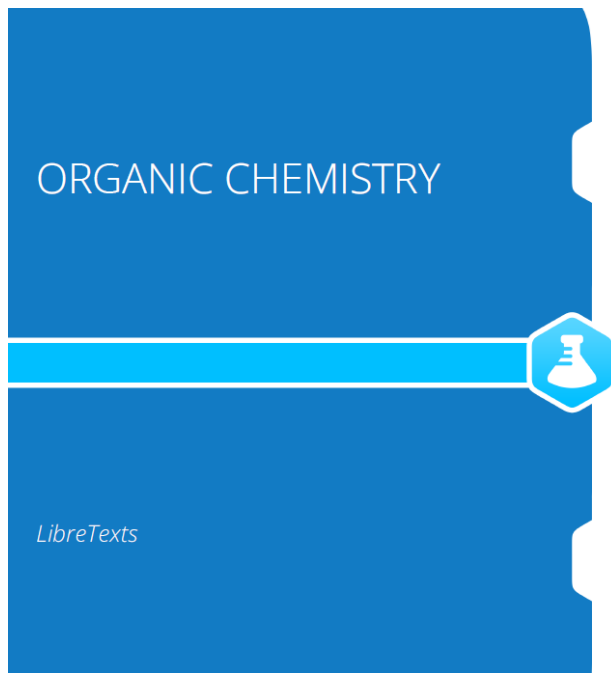
# OER Text for Organic Chemistry (Fall 2023)



- *Organic Chemistry* by **John McMurry, Ph.D.**, will be available from OpenStax for Fall 2023 courses
- John will publish the book with OpenStax under an open license. This text will be **free for students** as a tribute to John's son Peter, who passed in 2019 after a long struggle with cystic fibrosis
- OpenStax has published over **45 free titles** to date, saving students over \$1.7 billion since 2012



# Organic Chemistry (LibreTexts)



- Newly available (Sept 2022)
- Can be remixed into a custom text

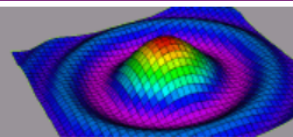
# Online Homework Options for Chemistry

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myOpenMath



## Welcome



## Free and Open

### Students

Are you a student looking to study mathematics on your own, and want to do exercises with immediate feedback as you work through a free and open textbook? Then read more about our [self study courses](#).

### Instructors

Are you an instructor who wants to adopt an open textbook, who feels online interactive homework is valuable, but doesn't want their students to have to pay an additional fee? Then read more about [using MyOpenMath in the classroom](#).

### Getting Started

If you already have an account, you can log on using the box to the right.

If you are a new student to the system, [register as a new student](#)

If you are an instructor, you can [request an instructor account](#)

### Login

Username:

Password:

Login

[Register as a new student](#)

[Forgot Password](#)  
[Forgot Username](#)

# MyOpenMath Platform

myopenmath.com

## Favorite Features

- ✓ Developed for math classes
- ✓ Question banks created by faculty
- 5570 chemistry questions**
- ✓ Algorithm questions robust
- ✓ Can be integrated into Canvas

## Challenges

- ✓ Questions are difficult to sort
- ✓ Writing your own questions is time-intensive – coding knowledge helps!
- ✓ No organic chemistry



[Log In](#) [Contact Us](#) [Register](#) ▼

# ADAPT

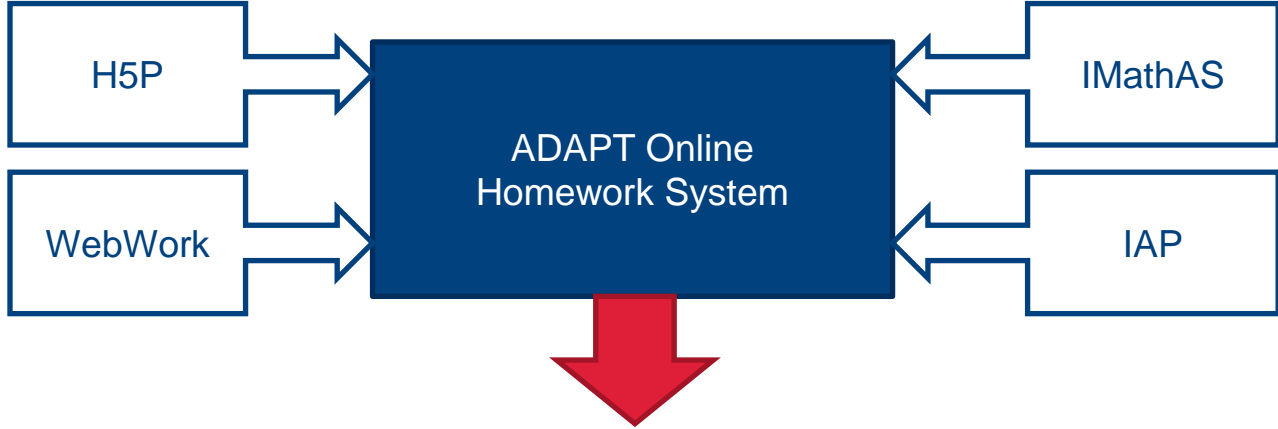
The Libretexts Adaptive Learning Assessment System

[Commons](#)



# ADAPT question banks

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Canvas, Your Gradebook, Individual Practice, etc.

# LibreText ADAPT Platform

[adapt.libretexts.org](https://adapt.libretexts.org)

## Favorite Features

- ✓ Developed as part of LibreText Megaverse
- ✓ Question banks created by LibreText team
- ~**5000 chemistry questions (+)**
- ✓ Can sort by course content
- ✓ Organic chemistry questions exist

## Challenges

- ✓ Many questions in library are instructor graded/limited feedback
- ✓ Very difficult to find questions in libraries

# ADAPT Workshops for Faculty

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- Sponsored by LibreTexts and ASCCC OERi
- For instructors – learn how to use ADAPT to supplement existing OER texts for online homework or as clicker questions
- Introduce use of existing H5P, WebWork, IMathAS, and QTI autograded questions, and how to build new questions
- Folsom River College (11/18), Chabot College (11/19), San Diego City College (12/2), and College of the Canyons (12/3) from 9-3 PST

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Discussion - How we can move forward?



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Thank you!

# Sources

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1. Ma, Jennifer, Matea Pender, and CJ Libassi (2020), *Trends in College Pricing and Student Aid 2020*, New York: College Board.
2. Seaman, Julia, Jeff Seaman (2018), *Freeing the Textbook: Educational Resources in U.S. Higher Education*, Babson Survey Research Group.
3. Grimaldi, Phillip, *et al.* (2019), *Do open educational resources improve student learning? Implications of the access hypothesis*, PLoS ONE 14(3): e0212508
4. AAP Communications (2020), *AAP Video: Student Spending on College Course Materials Continues Multi-Year Decline*, AAP Communications. Accessed 5/2013 at <https://vimeo.com/432496326>
5. Survey of California community college faculty teaching chemistry (2022), Academic Senate of the California Community Colleges OERi. Contact: Michelle Pilati (mpilati@asccc.org)