

Peer-Led Team Learning

General Chemistry (120A, 120B, 131, 121A, 121B):

- ❖ Faculty: Holovics Wiediger Norcio Finger Shaw Kniepkamp
- ❖ Many sections, ~1000 students per semester
- ❖ 50-minute session once a week built into schedule
- ❖ Small 10 student workshops lead by students for practice

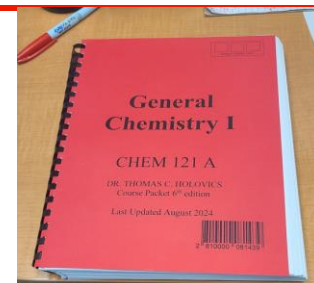
Student Feedback

- ❖ Small group directed sessions helps individual attention
- ❖ Very easy to ask questions to peers
- ❖ Solidifies classroom problem solving



Course Packets to Improve Student Notetaking

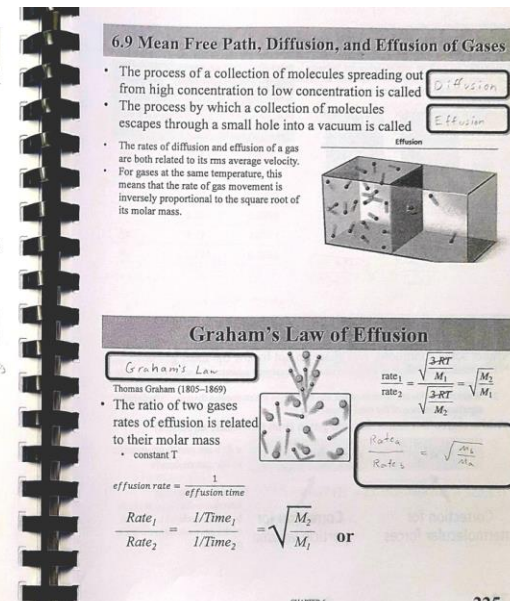
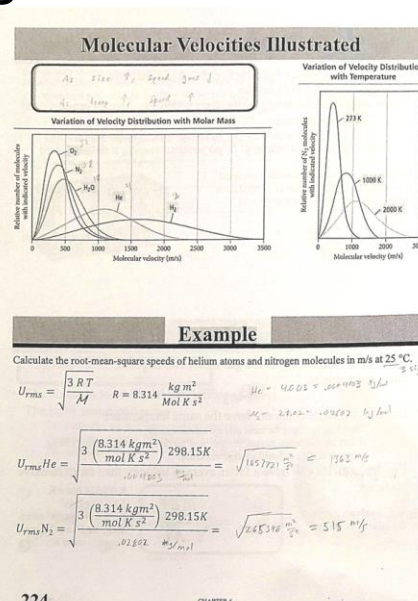
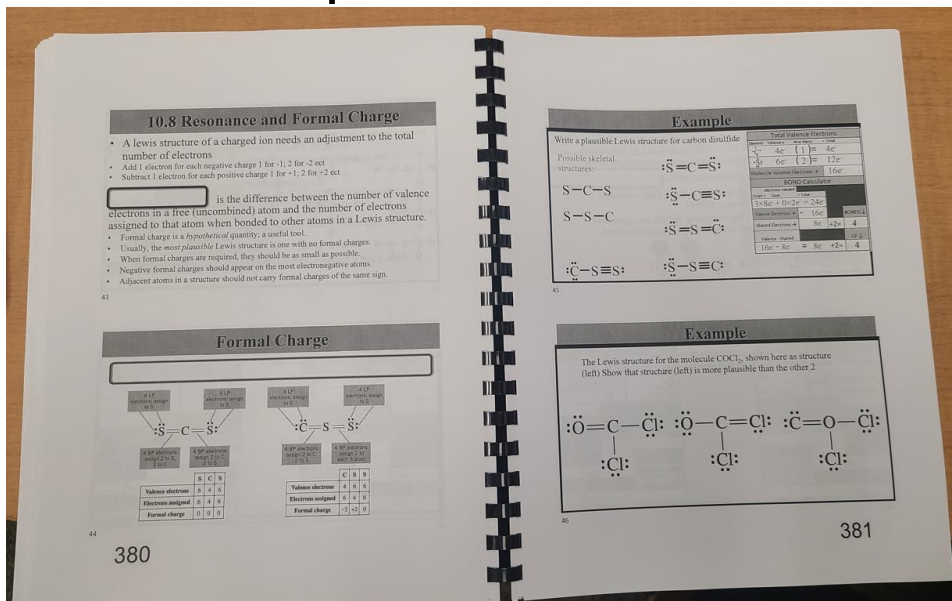
General Chemistry (120A, 120B, 121A, 121B):



- ❖ Faculty: Hologovics Norcio Kniepkamp
- ❖ Roughly ~600 students per semester
- ❖ Produced lecture course packets to facilitate notetaking

Student Feedback

- ❖ Very helpful to guided notetaking
- ❖ Great study tool during and after the semester
- ❖ Keeps attentiveness during the lecture to fill in the boxes



New Initiatives: Learning Catalytics

General Chemistry (121A, 121B):

- ❖ Faculty: Holoivics
- ❖ Roughly 200 – 300 students per semester
- ❖ Students use any internet capable device(phone laptop ipad)
- ❖ Classroom response system. BB integration. Real time stats
- ❖ Wide range of question types

Student Feedback

- ❖ They like how it keeps them engaged with the lecture (55)
- ❖ They like getting rewarded for participating in class (30)
- ❖ Going over some of the questions to learn from mistakes (29)
- ❖ Getting challenged to apply the new content learned (21)

Future Refinement

- ❖ Streamline the amount of lecture time it takes
- ❖ Incorporate group work
- ❖ Polish questions types and formatting

Learning Catalytics Through Pearson

3. short answer

Write the symbol from the periodic table of the element with this electron configuration:



Round 1 x 9

● 177 responses, 88% correct

Ru: 88%

Zr: 2%

Rh: 2%

Pd: 2%

Mo: 1%

Te: 1%

Rs: 1%

Sn: 1%

Ruthenium: 1%

Rn: 1%

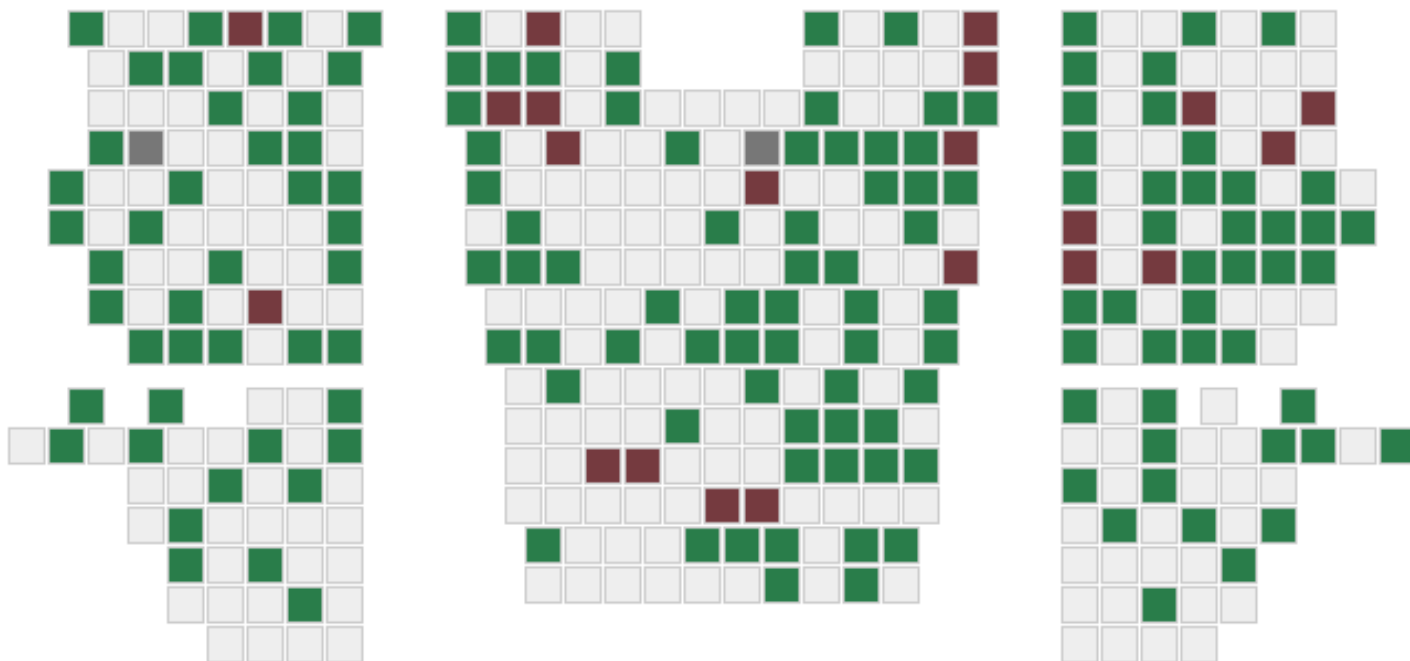
Sc: 1%

Se: 1%

Sm: 1%

Cd: 1%

Seat map



Learning Catalytics

A Variety of Question Types

The image displays a grid of 21 different question types available in Learning Catalytics. Each type is represented by a small thumbnail showing a sample question or interface. The types are arranged in three rows: the first row has 7 types, the second row has 6 types, and the third row has 8 types.

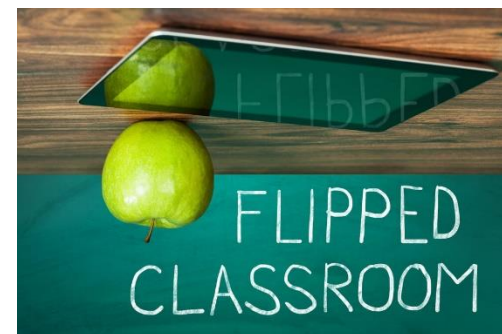
- Many choice:** A horizontal bar chart showing four options (A, B, C, D) with their respective percentages: A: 8%, B: 89%, C: 66%, D: 33%.
- Matching:** A grid of five numbered boxes (1-5) and five lettered boxes (A-E) for matching.
- Multiple choice:** A horizontal bar chart showing three options (A, B, C) with their respective percentages: A: 33%, B: 8%, C: 77%.
- Numerical:** A horizontal bar chart showing three numerical options (1, 2, 3) with their respective percentages: 1: 67%, 2: 33%, 3: 6%.
- Data collection:** A vertical bar chart showing five numerical ranges with their respective percentages: 0.00-1.00: 19%, 1.00-2.00: 21%, 3.00-4.00: 31%, 4.00-5.00: 19%, 7.00: 6%.
- Direction:** A diagram showing a green arrow pointing right and several red arrows pointing in various directions from a central point.
- Region:** A scatter plot with red dots and a green shaded region.
- Expression:** A text input field with a green bar indicating the percentage of correct answers: 1/(2d): 1%, 1/r: 94%, 1/(r*sin(theta)): 1%.
- Highlighting:** A text passage with a green highlight over the words "Seeking that beaut".
- Image upload:** A grid of six small images showing different orientations of a triangle.
- Long answer:** A text input field containing a list of bullet points about electric fields and resistors.
- Composite sketch:** A grid of six small sketches showing different orientations of a triangle.
- Confidence:** A horizontal bar chart showing three options (A, B, C) with their respective percentages: A: 33%, B: 8%, C: 77%.
- Short answer:** A text input field containing a list of bullet points about electric fields and resistors.
- Sketch:** A grid of six small sketches showing different orientations of a triangle.
- Word cloud:** A word cloud with the word "practice" in the center, surrounded by other words like "observing", "work", "school", "family", "workin", "work", "good", "experience", "learning", "others", "people", "through", "time", "practicing", "watching", "experien".
- Slide:** A computer monitor displaying a blue screen.
- Priority:** A horizontal bar chart showing four categories (pigeons, cats, dogs, hamsters) with their relative strengths of preference.
- Ranking:** A horizontal bar chart showing three options (a) < (b) = (c): 10%, (a) < (b) < (c): 39%, (a) < (c) = (b): 2%.

Preliminary Findings

- ❖ Attendance has been much stronger
- ❖ Classroom attention has increased
- ❖ Student success on graded assessments have increased

FLIPPED Learning in Organic Chemistry

- ❖ Fall 2018: Attended NSF-IUSE iFLIP Workshop (Dr. Chaya Gopalan)
 - Flipped Organic I/II lectures
 - Collected data regarding faculty and student perceptions and performance



Student Perception of Learning Surveys: Key Findings

- ❖ Feel more engaged and confident
- ❖ Would take another flipped class; overall positive attitude
- ❖ More comfortable with video lectures (post-pandemic)
- ❖ Challenges:
 - Poor note-taking skills
 - Student reliance on ability to look up information
 - Fewer students participate in optional learning opportunities (challenges of student buy-in)

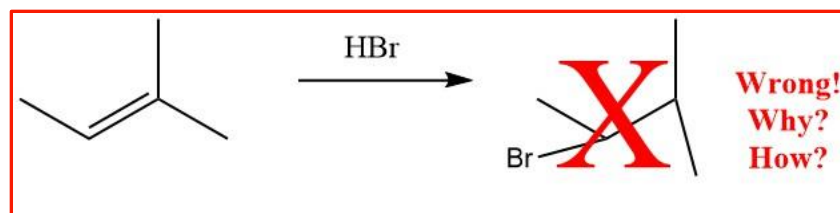
Faculty Developments for Organic Chemistry

Organic Chemistry (241A/B):

- ❖ Faculty: De Meo, Lu, Luesse, Miller
- ❖ 4 sections each semester, 35-120 students each
- ❖ Either MWF 50-minute or TR 75-minute sessions
- ❖ 3 credits, primarily STEM majors

Issues we face:

- ❖ Difficulty scheduling optional help sessions that are embraced by students most in need of assistance
- ❖ Decreased participation in office hours
- ❖ Challenge of providing timely feedback on drawings
- ❖ Students need structured time for reflection/practice



Organic Chemistry (CHEM 241A/B)

To address these issues:

- ❖ Added extra contact hour - no change to credits
- ❖ Faculty had to develop activities/problem sets
- ❖ Variations in implementation by instructors
 - Optional vs required sessions
 - Points for activities
 - Small group work vs whole class problem-solving

Benefits:

- ❖ More faculty contact
- ❖ Direct, timely feedback to students
- ❖ Small group work building stronger peer community
- ❖ Problem-solving that can push beyond fundamentals
- ❖ Students more likely to ask follow-up questions

