Evaluating Students' Uses of Screencasts

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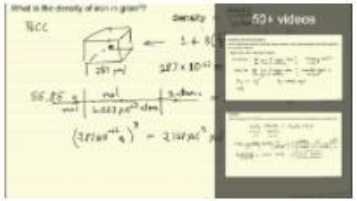
What is a screencast?

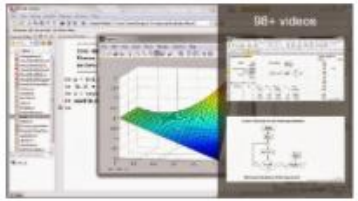
- Short videos (<10 min) with narration made using digital capture technology.
- Focus on a single topic, simulation, or sample problem.
- Peer-reviewed.
- Can be used to supplement classroom instruction or as a study aid.

Screencasts

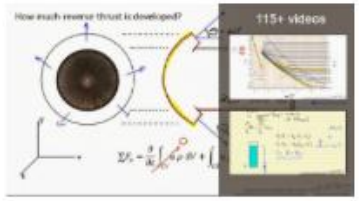
Screencasts are short screen captures, usually of a tablet PC, with instructor narration. They supplement textbooks and lectures by featuring solutions to example problems, explanations of concepts, software tutorials, descriptions of diagrams, and material reviews. They are made and reviewed by faculty. (CC) indicates the entire playlist has closed captioning. Screencasts are available for the following engineering courses/topics:



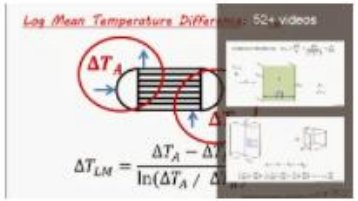
Chemistry



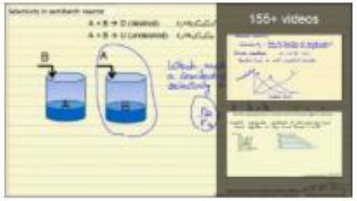
Engineering Computing



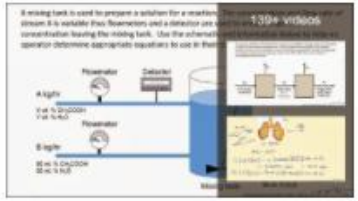
Fluid Mechanics (CC)



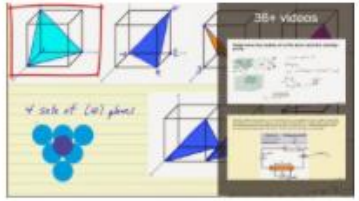
Heat Transfer



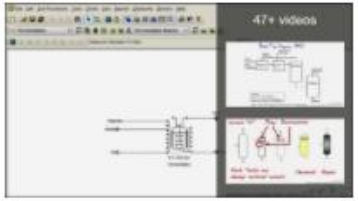
Kinetics/Reactor Design



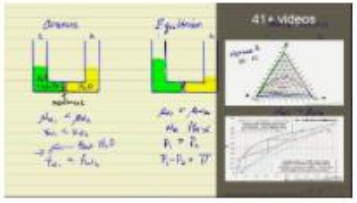
Material and Energy Balances (CC)



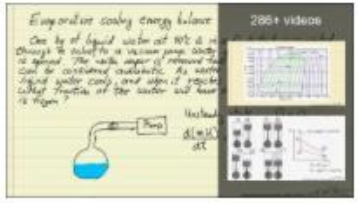
Materials Science (CC)



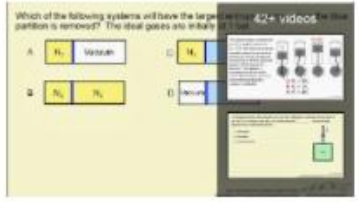
Process Design



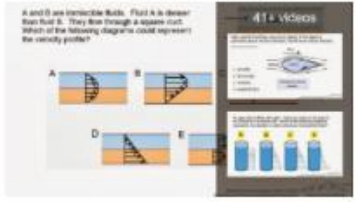
Separations/Mass Transfer



Thermodynamics



Interactive Thermodynamics



Interactive Fluids

Screencasts

- 1,100 Titles
  - In chemistry, fluid mechanics, heat transfer, kinetics, mass and energy balance, and more.
  - Introductory, problems, tutorials, conceptual questions, interactive, and reviews.
- 4.9 million views (YouTube and iTunesU).
- 2.1 million downloads in 12 months.
- 135 countries.

LearnChemE Project Goals

- Ensure comprehensive coverage of chemical engineering topics, including increased coverage for basic topics.
- Evaluate effectiveness of screencasts.
- Understand faculty/student usage to improve screencasts.
- Expand usage through faculty support and increasing ease of use for students.

Purpose of our Study

- Identify aspects of screencasts that help students learn, and barriers that impede learning.
- Collect information for improving the screencasts.

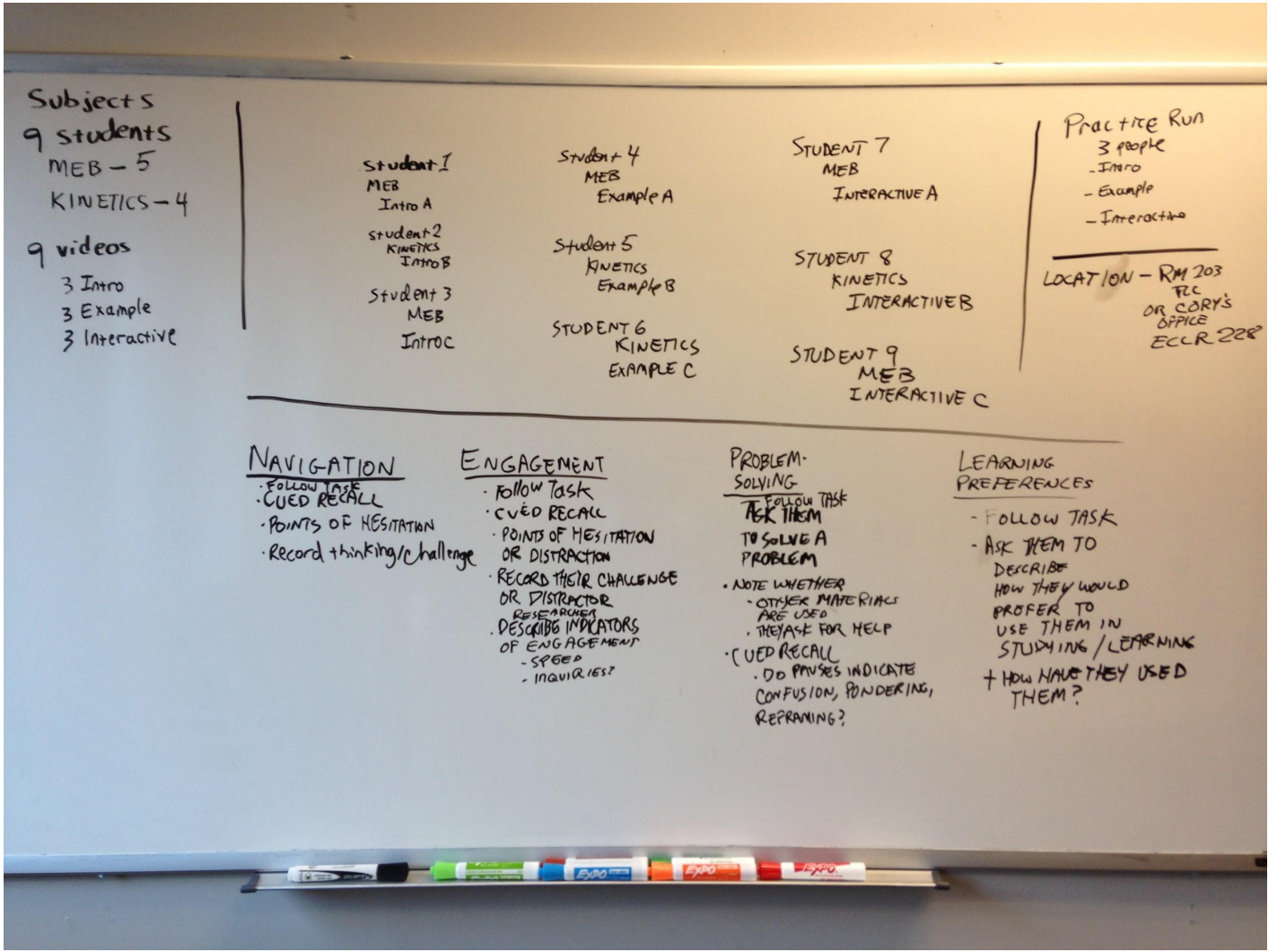
Method

7 students volunteered.

Participants were asked to watch 2 screencasts each.

They answered questions about their experience and made suggestions to improve usability.

Conducted using Silverback on a MacBook Pro laptop.



Findings

Presentation—Content

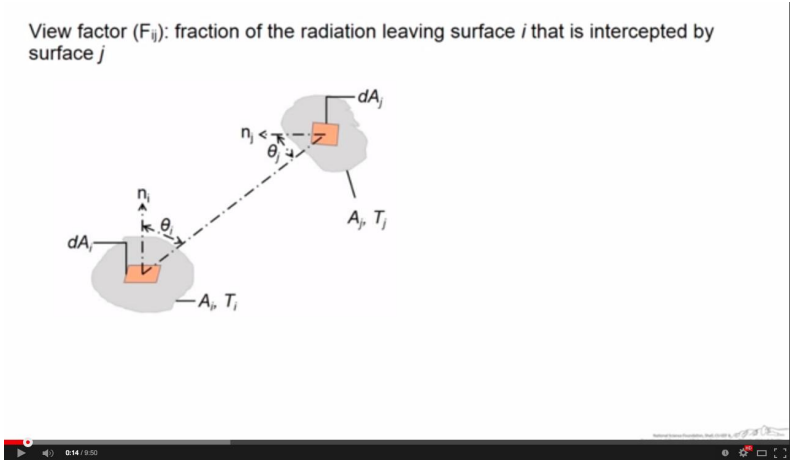
- Include a clear problem statement at the beginning.
- Include links to other similar screencasts.
- Divide longer screencasts into chapters for easier navigation.

Presentation—YouTube

- Include a brief description of the content of a screencast in the video description on YouTube
- Put similar screencasts in a YouTube playlist.

Pacing—Narration

Narration should be fast enough at the beginning to capture attention.

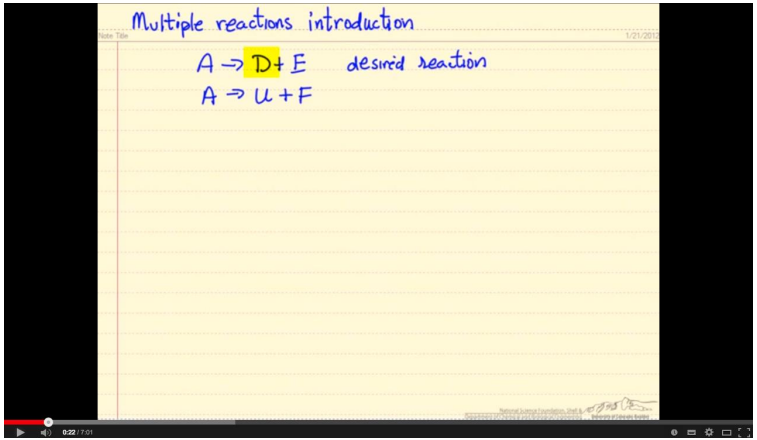


http://www.youtube.com/watch?v=UIfRBB49MC4&list=PL242066E80621CC10&feature=share&index=59

Pacing—Narration

...and yet, narration should also be slow enough so that when explaining concepts, or solving problems, students can comprehend what is being presented.

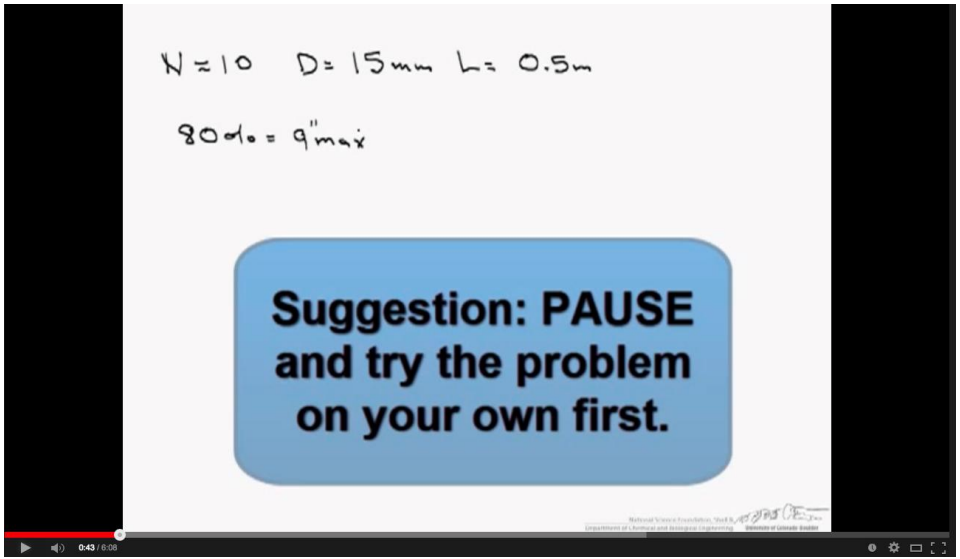
https://www.youtube.com/watch?v=2ugTnETtlyM



Pacing—Narration

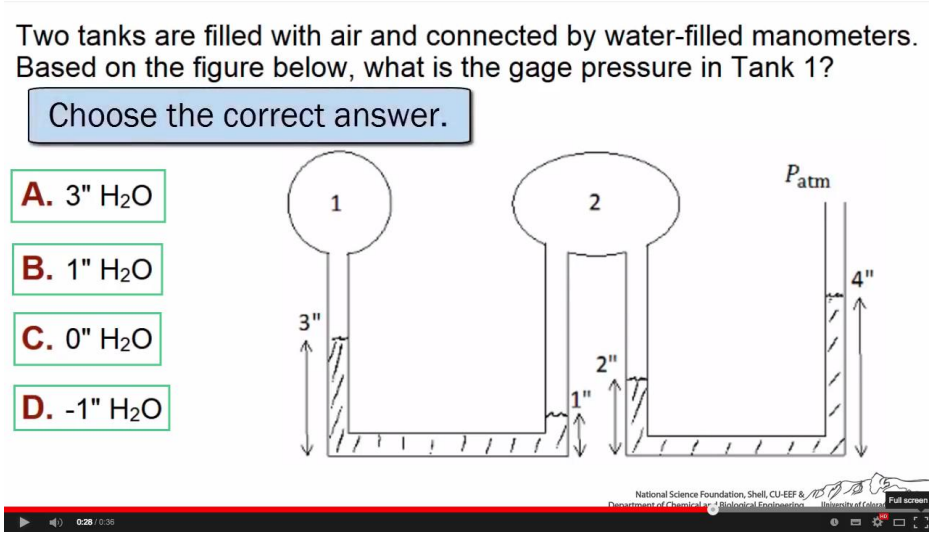
Students should be encouraged to pause, and take notes if needed.

http://youtu.be/mGzreZwoaJ0?t=40s



Pacing—Pauses

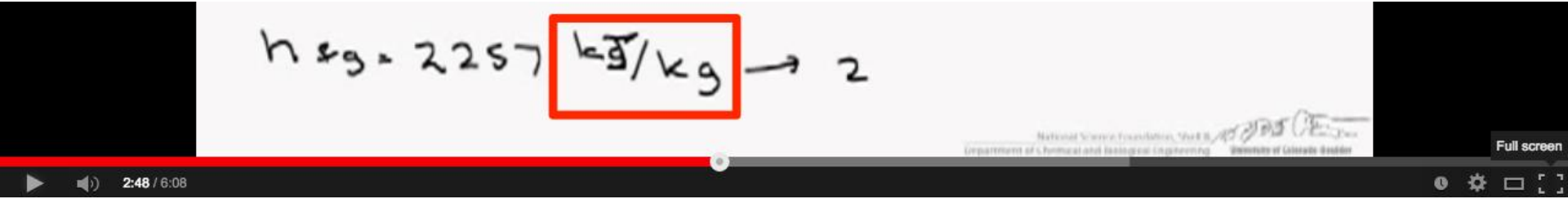
When including formative assessment questions, include adequate time for students to select a response to a question.



http://www.youtube.com/watch?v=EGrWGfI30dQ&feature=youtu.be

Presentation—Writing

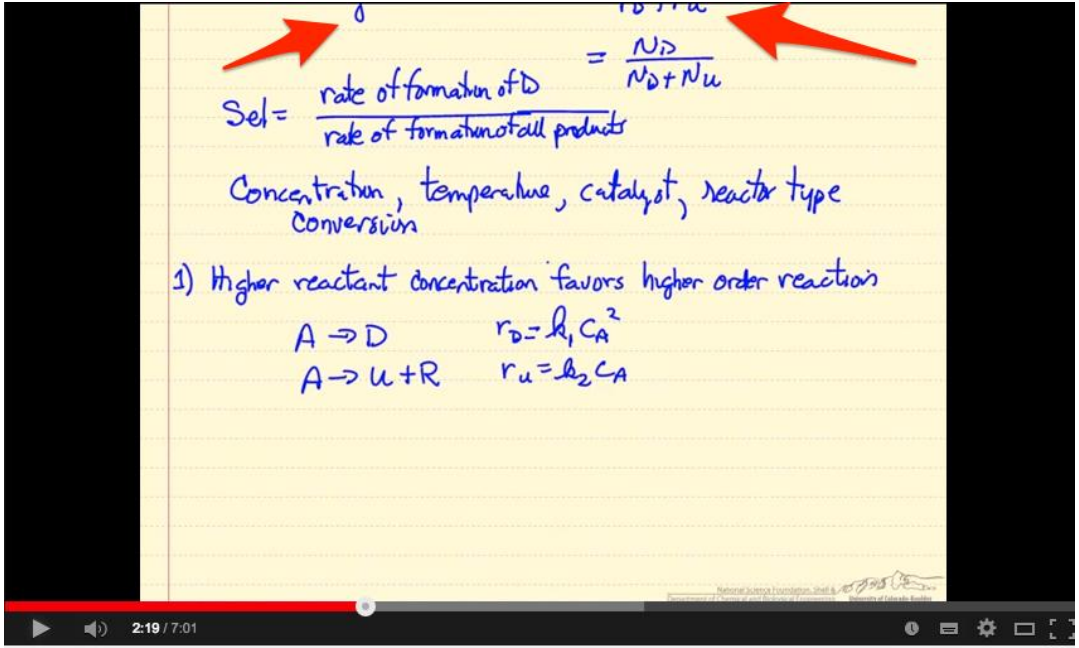
Writing should be legible, and mistakes should be corrected before publishing.



http://youtu.be/mGzreZwoaJ0?t=2m36s

Presentation—Scrolling

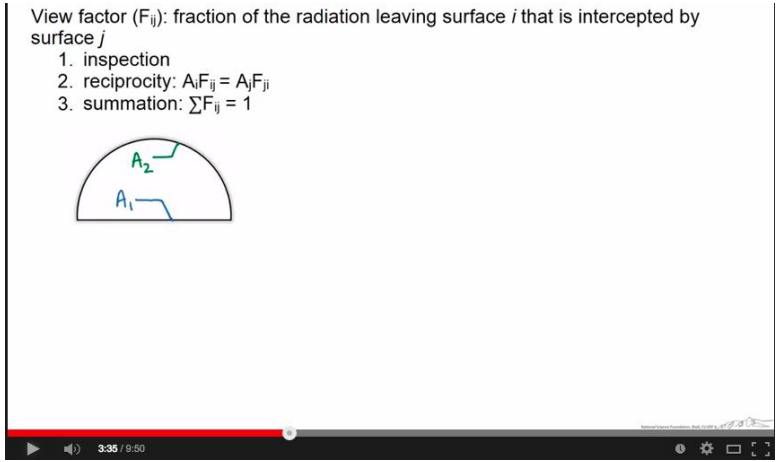
Keep long text spans from scrolling off of the screen.



http://youtu.be/2ugTnETtlyM?t=2m6s

Presentation—Highlighting

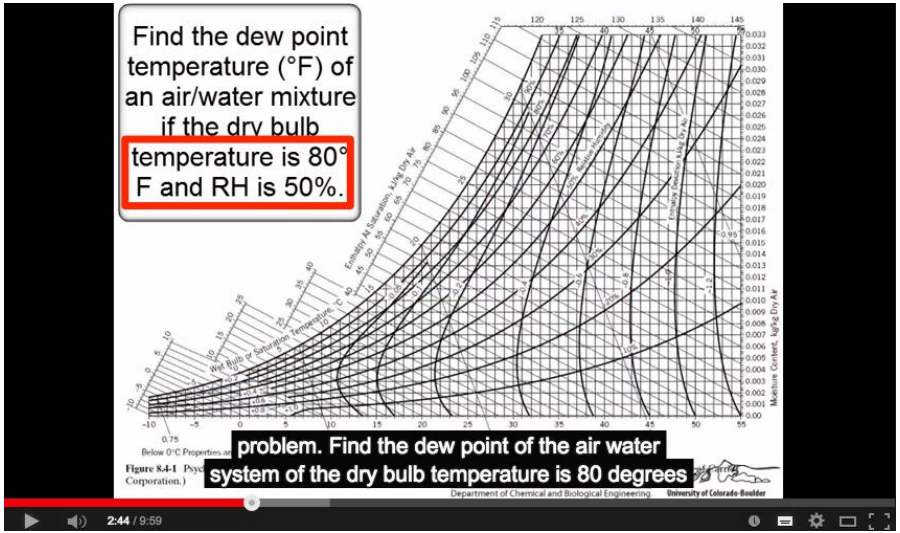
- Highlighting should appear before it is orally introduced.
- Use permanent highlighting instead of temporary highlighting.

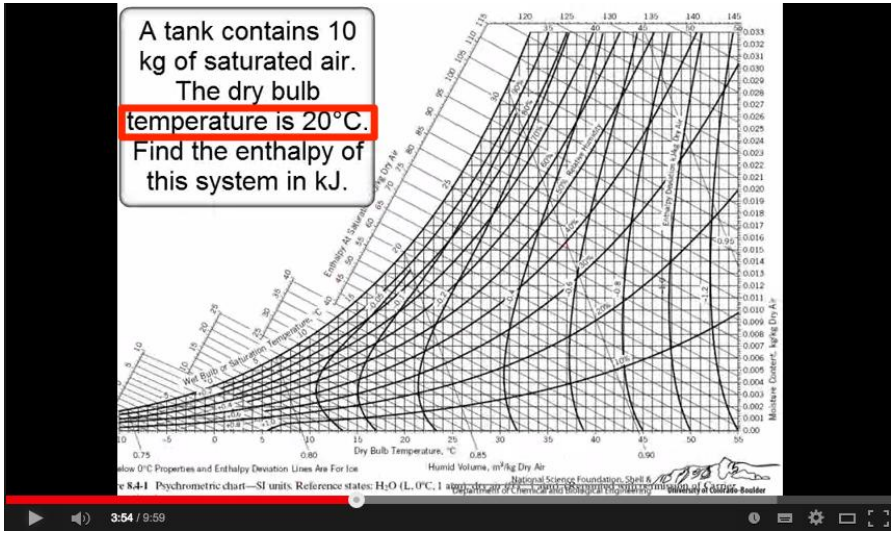


http://youtu.be/UIfRBB49MC4?t=3m36s

Presentation—Consistency

Units and labeling should be consistent throughout a screencast.

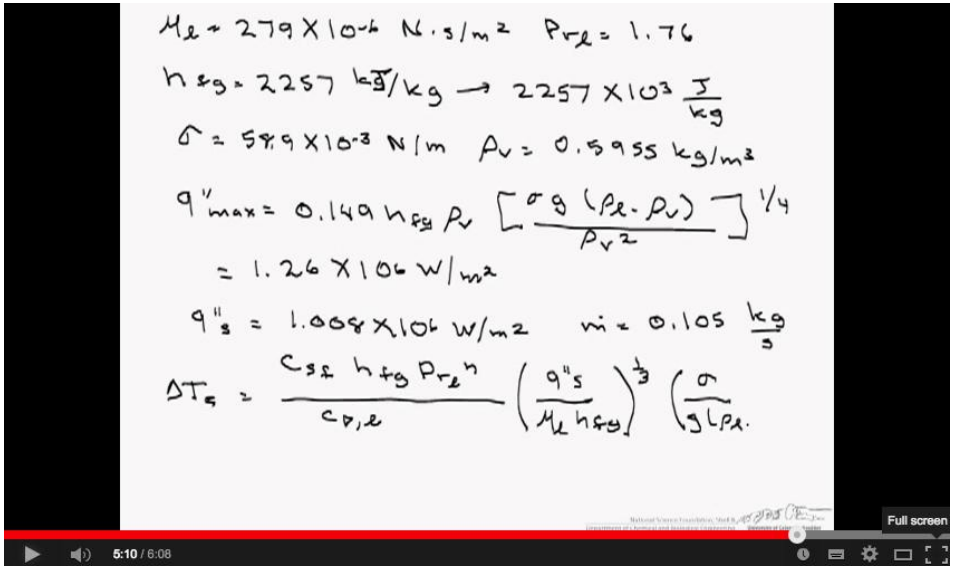




http://youtu.be/WU5J6XdG_TM?t=2m38s

Audio Quality

Ensure audio quality is good (no scratches or hums).



http://youtu.be/mGzreZwoaJ0?t=4m6s

https://www.youtube.com/watch?v=mGzreZwoaJ0

Next Steps

- Findings used to inform revisions to current screencasts and development of new screencasts.
- Second round of usability studies to examine these findings in greater depth.
- Ongoing data collection to tie screencast characteristics to student use and understanding.

Project Team, University of Colorado

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- Katherine McDanel: Project Assistant
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Natanya Cooper, Massiel Puentes, Joel Bozekowski, Gregory Russi, Xiao Ba, Isabella Funke, Zachary Gibbs, Michael Holmberg, Cuining Liu, Audrey Schaiberger

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