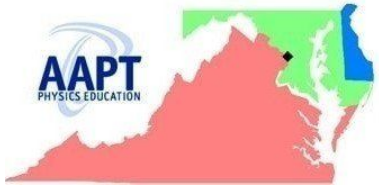

CSAAPT SPRING 2024 Semi-Virtual Meeting
Saturday March 16, 2024
Delaware State University, Dover, DE

The Right Amount of Flip

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&
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The idea of the Flipped Classroom has been around for many years, but in order for it to be valuable the purpose of the flip must be clearly understood, and the method must be used judiciously. Over-flipping leads instructors and students alike to believe that the entire process is poor pedagogy.

In this talk, I describe the general Flipped Classroom and analyze the parts of the introductory physics course that could be flipped to the best benefit of the student and the instructor. Attention will be given to engendering student participation in the process, and identifying aspects of the course that do not work well with this pedagogy.

Identifying the Speaker & Audience for this talk:

- I am approaching this conversation as a high school teacher,
- …even though I am not actually a high school teacher anymore,
- The COVID-19 Pandemic impacted this pedagogical topic, and our teaching.
  - Online courses were forced upon schools who were not prepared,
  - There is no reason to assume our collective performance was reflective of our capabilities

Motivation for this Talk

What is Flipping?

- An “Active Learning” pedagogy,
- Students engage in foundational learning before coming to a group class,
  - Reducing cognitive load during shared time,
  - Improving practice or drill opportunities during shared time,
  - Allowing nuanced expansion of topics during supervision.

What is Flipping?

Key Points:

1. Provide an opportunity for students to gain first exposure (to a new topic) prior to class.
2. Provide an incentive for students to prepare for class.
3. Provide a mechanism to assess student understanding *(note - in class may be better than pre-class)*
4. Provide in-class activities that focus on higher level cognitive activities.

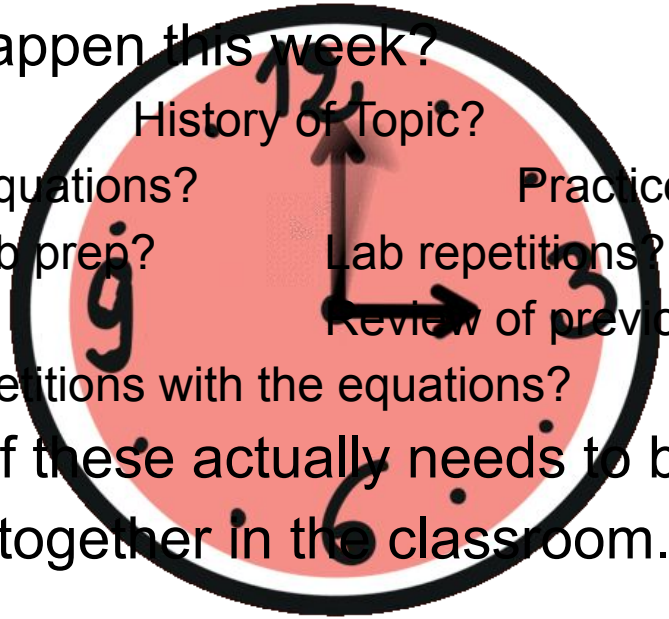
Brame, C. (2013). Flipping the classroom. Vanderbilt University Center for Teaching. Retrieved 14 Mar 2024 from http://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom/.

Why do Students Resist the Flip?

- It’s unfamiliar.
- It requires front-loaded effort outside of class.
- Somebody else did it poorly before your class.
  - Over-use (everything is on video, bad/long videos, etc.),
  - Somebody used the term “flip” for some other approach.

What is the POINT of Flipping?

- Time is limited!
- What needs to happen this week?
  - Exposition? History of Topic? Vocabulary?
  - Derivations of Equations? Practice Using Equations?
  - Lab? Lab prep? Lab repetitions? Data analysis?
  - Assessments? Review of previous topics?
  - Just… more repetitions with the equations?
- Prioritize which of these actually needs to be done during our very limited time together in the classroom.



Suggestions

- Use in Lecture Course
  - Short vids of exposition. Separate vids for example problems.
  - Encourage alternate sources you have vetted.
  - Encourage students to submit questions (in advance).
- Use in Lab Course
  - Short vids of equipment setup, software expectations.
  - Pre-established norms and expectations for data & submissions.
- Test Prep Course
  - Loads of worked problems, students can pause and try on their own.

2/23 Student Questi

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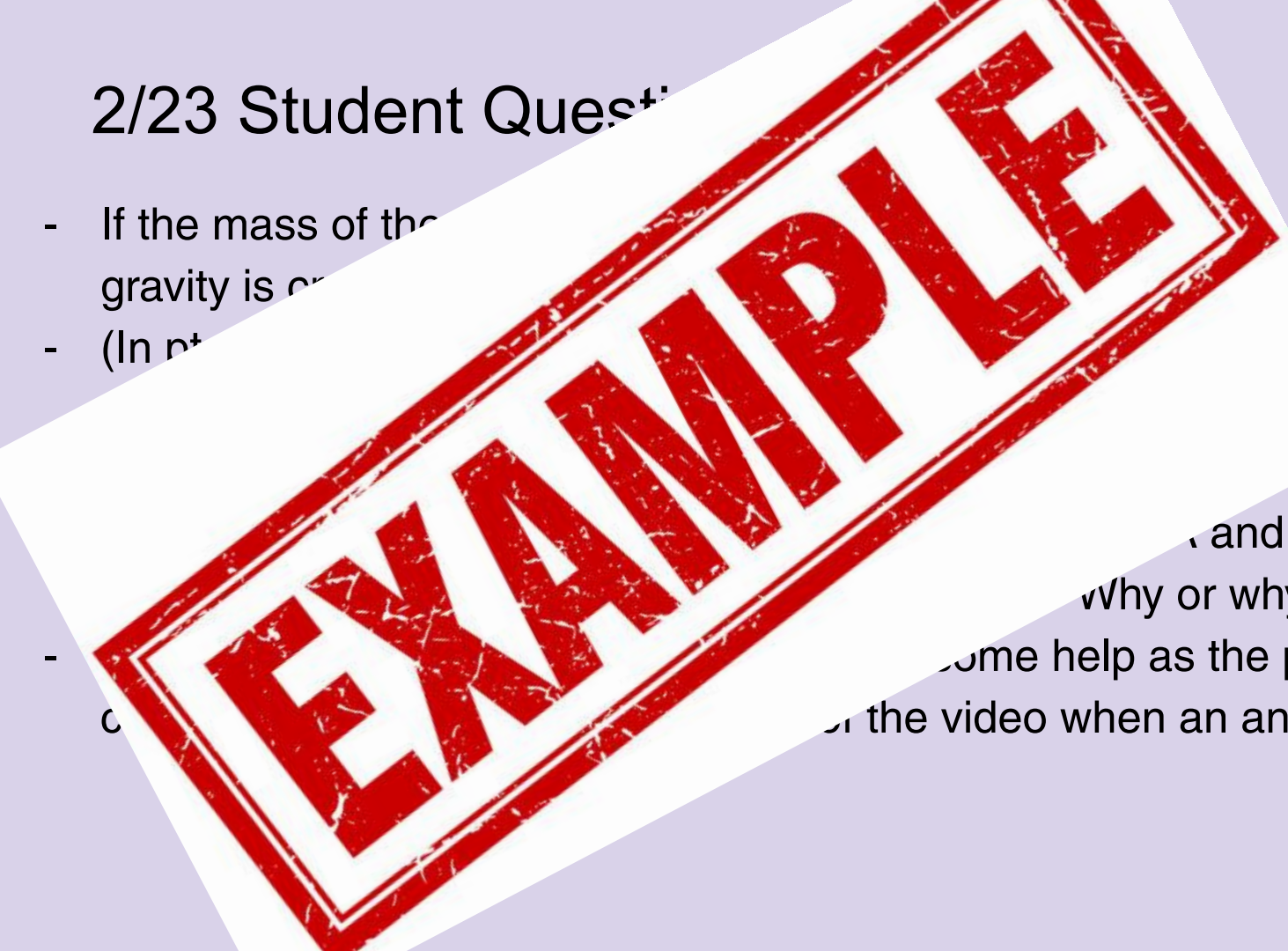

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3/18 Student Qu

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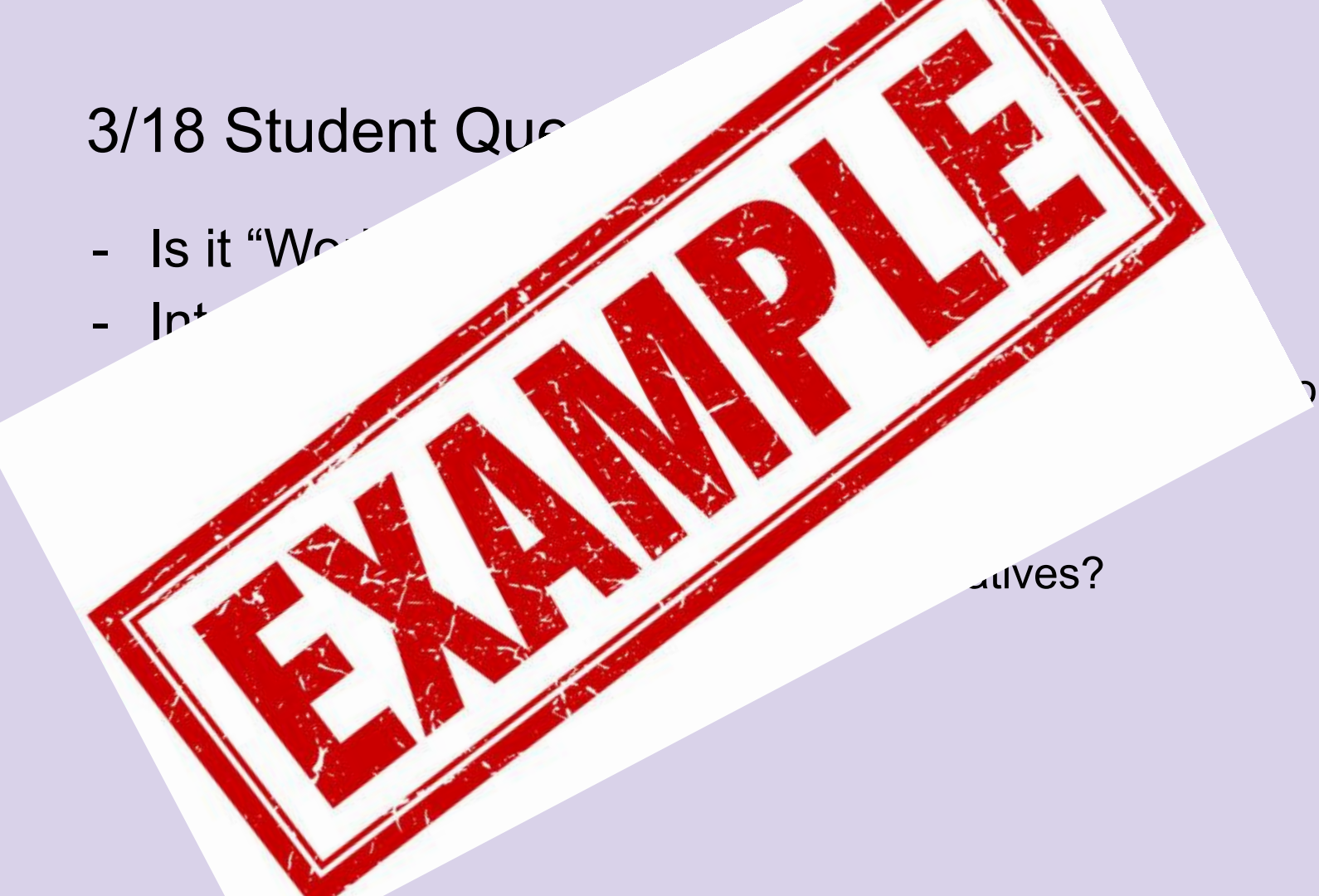
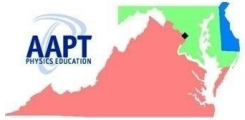


How do Students Learn to Embrace the Flip?

- Clarity: share the research with students (and parents),
- Intentionality: be clear about your purpose. Let this be more than "*no snowdays*", or documenting tech use, or COVID.
- Autonomy: Students need to know it's ok to watch on 2x, or to pause and rewind, so long as they are passing the assessments and participating in class. The ability to ask questions about the lecture is vital to this!
- Respect: Students must see that time together in class is valued by instructor. If you don't act like the time together is precious for the purposes of teaching students to master the subject, then they won't act that way, either!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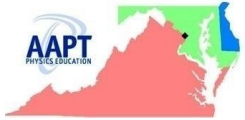
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Final Thoughts

The implementation of any pedagogy without proper understanding of its purpose, its limitations, and its theoretical (psychological) underpinnings risks harming students' performance, both in that class and in future classes.

Discussion

More Reading

- Hake R (1998). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. American Journal of Physics 66: 64-74.
- Mazur E (2009). Farewell, Lecture? Science 323: 50-51.
- DesLauriers L, Schelew E, and Wieman C (2011). Improved learning in a large-enrollment physics class. Science 332: 862-864.
- To Flip or Not to Flip? A Meta-Analysis of the Efficacy of Flipped Learning in Higher Education. Carrie A. Bredow, Patricia V. Roehling, Alexandra J. Knorp, and Andrea M. Sweet Review of Educational Research 2021 91:6, 878-918

- https://www.flippingphysics.com/gifs.html