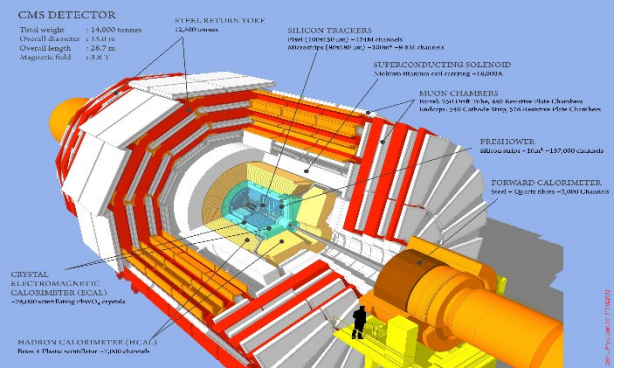
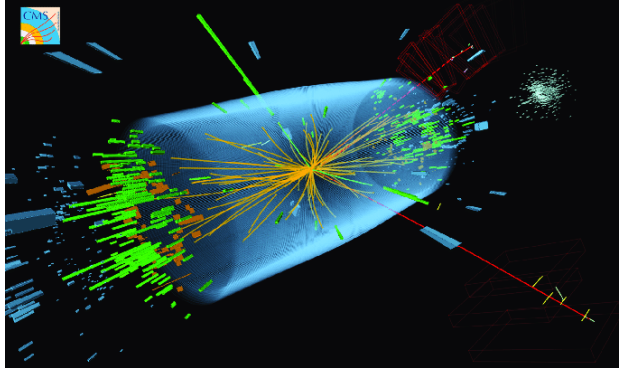


UNIVERSITY OF MARYLAND 18 56

FIRE: THE FIRST-YEAR INNOVATION & RESEARCH EXPERIENCE

SIMULATING PARTICLE DETECTION



Examples of Collaborative Tools Used During Remote-Learning

Muge Karagoz, UMD

CSAAPT Virtual Meeting, 4/17/2021

Outline

- What I teach?
- Interactive collaborative class tools that I've uses during the pandemic
  - Google Jamboard
  - Menti
- Conclusions

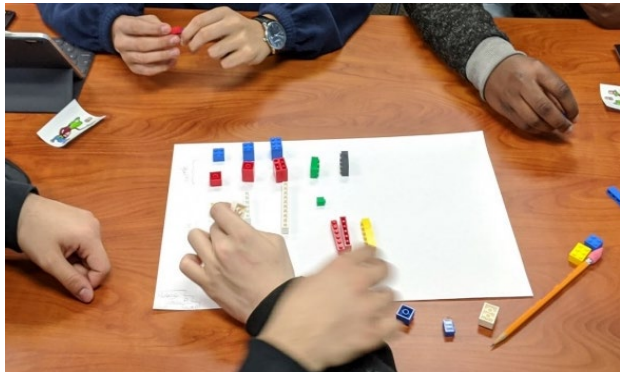
What I teach?

- A curriculum-based research course (“stream”) at UMD as part of the First-Year Innovation & Research Experience (FIRE) program (~15 FIRE streams).
- Each stream is a research group of one leader (Research Educator), 1-2 faculty advisors, ~ 35 students, and up to 15 Peer Research Mentors. Streams have 1 hr lecture and ~4-5 hrs lab time weekly, in a semester.
- My stream SPD (“Simulating Particle Detection”) introduces students to experimental high energy particle physics (HEP), concentrating on computing and data analysis, specifically CMS@CERN’s upgrade simulations.
- I am reasonably autonomous in running my stream’s research and curriculum. I follow a HEP philosophy: training, collaboration, leadership, peer-reviewing, community-building, resource-sharing, and mentoring.
- I find it powerful (and fun) to add active-learning components in my classes.

The 3-semester FIRE gen-ed Program (©FIRE)

What tools can be used?

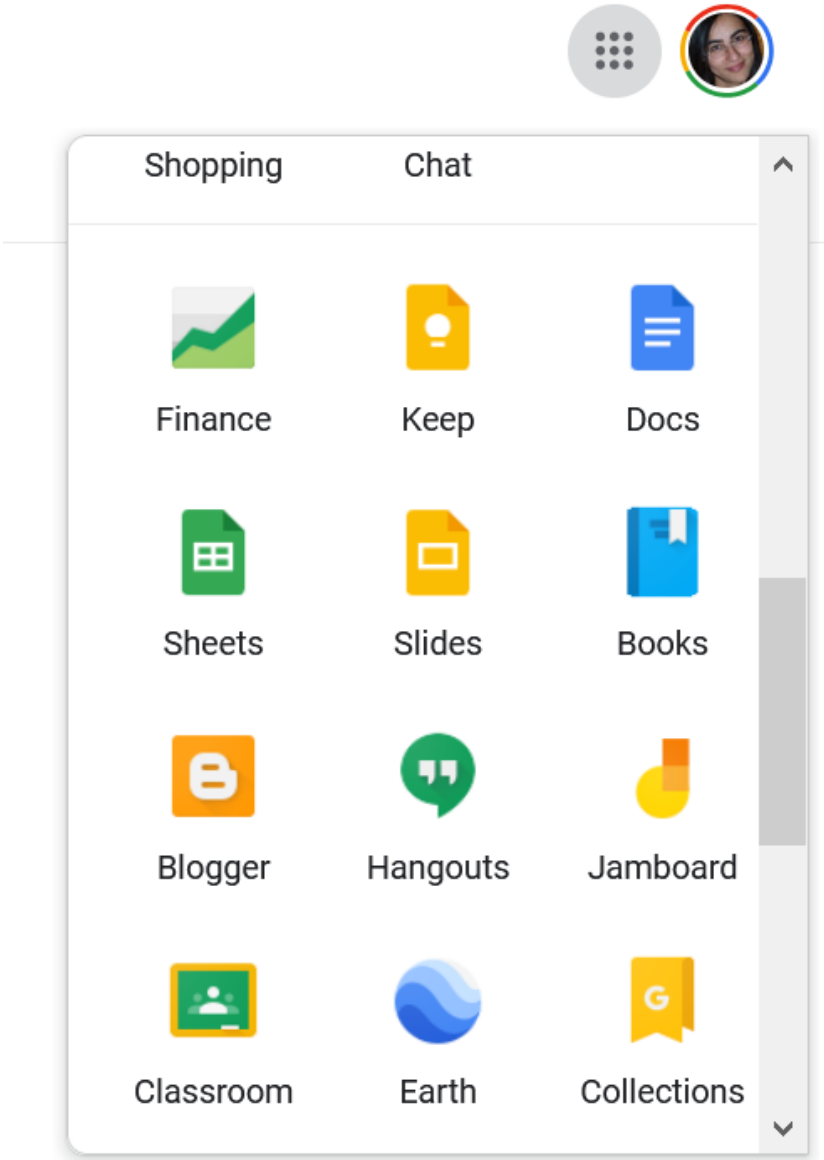
- What pedagogical purposes can tools be used for?
  - Community-building, fun ice-breaking
  - Educational & Research activities
- Being a curriculum-based research course, and a computational technology stream that concentrates on collaborative and research tools, I've utilized many online tools online either in-class or at research setting (Google Suite, GitHub, Overleaf, slack, trello, kahoot!)
- During the pandemic, I started exploring and using tools like Google Jamboard, or menti
- Many others available: poll everywhere, mural, … All is optimal for different purposes.



In-class and online physics activities also foster community building

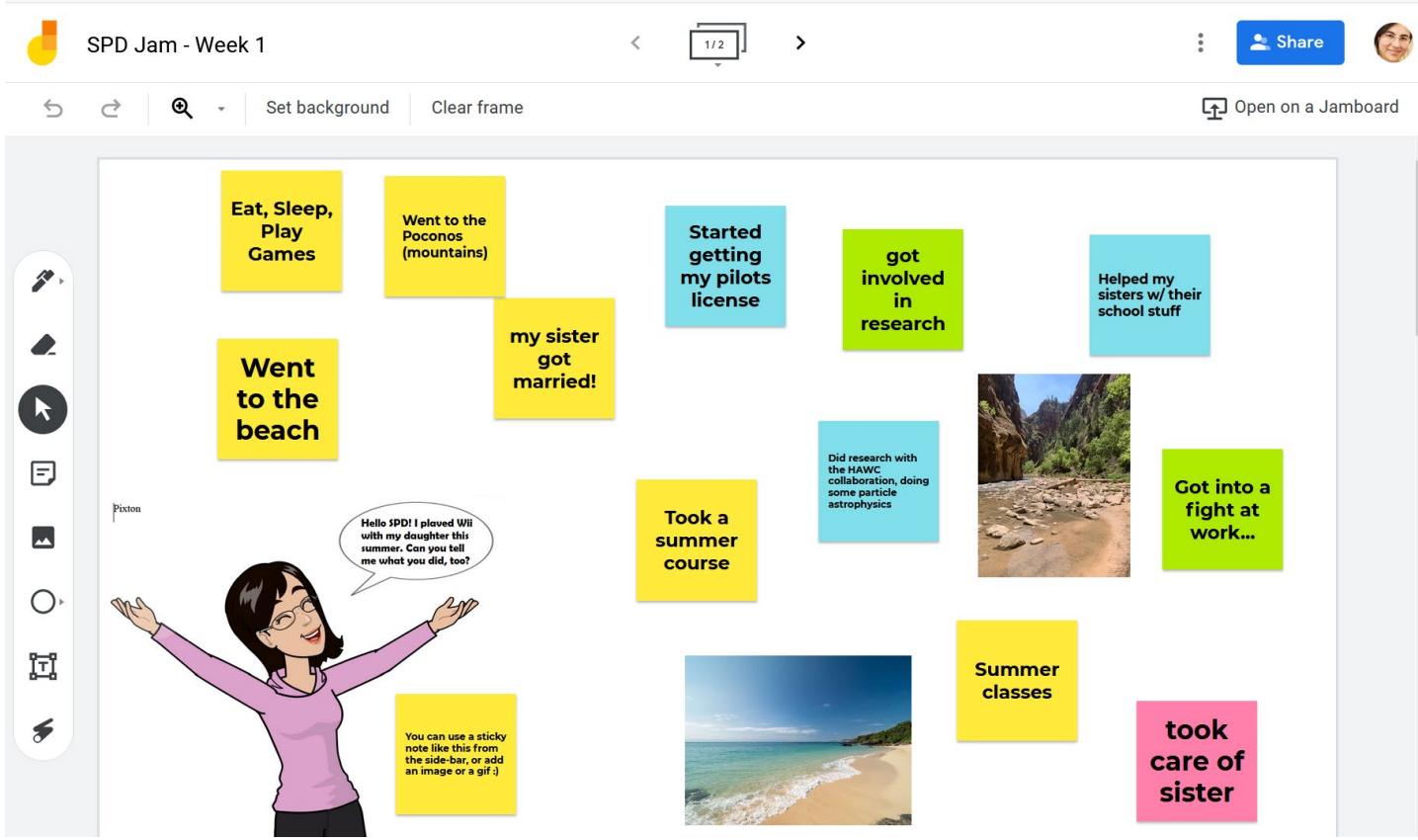
Tool 1: Google Jamboard

- Jamboard is an online interactive whiteboard tool for collaboration across multiple devices. Available with a G-suite account.
- UMD G-suite for Education gives my students full access to Google tools/apps.
- I use it only online by sharing links on my drive (no physical smartboard)
- Very basic functionality, so easy to use.
- Some cons:
  - Only 25 connections per jamboard. Solutions: Create multiple jamboards per session. Or use google drawing or a google slide for similar functionalities
  - I heard that there is accessibility issues for screen readers. Google slides or drawing would, then again, is an option.



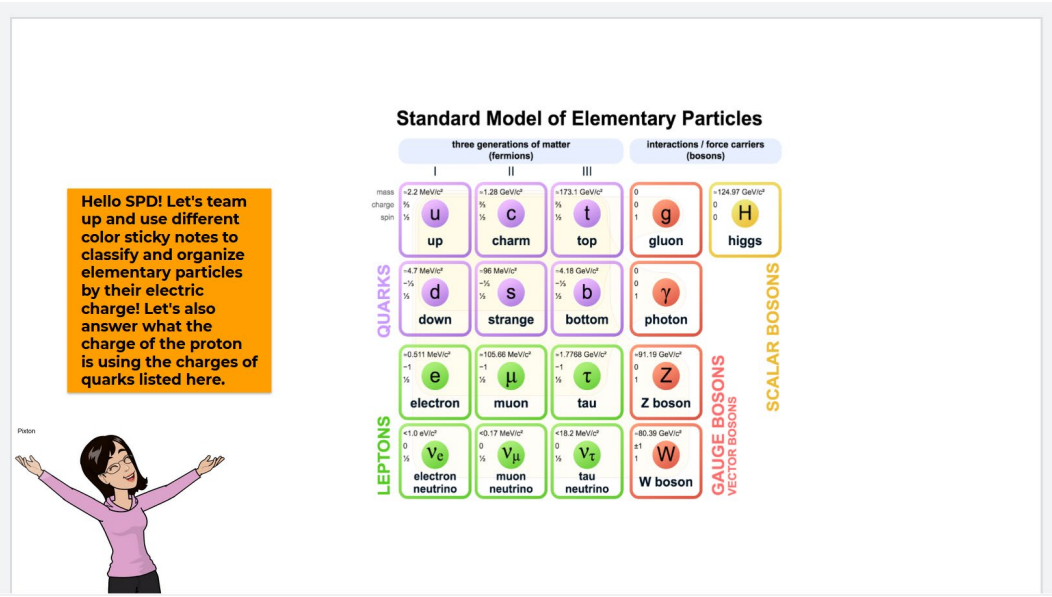
Example 1: Community Building/Ice-breaking

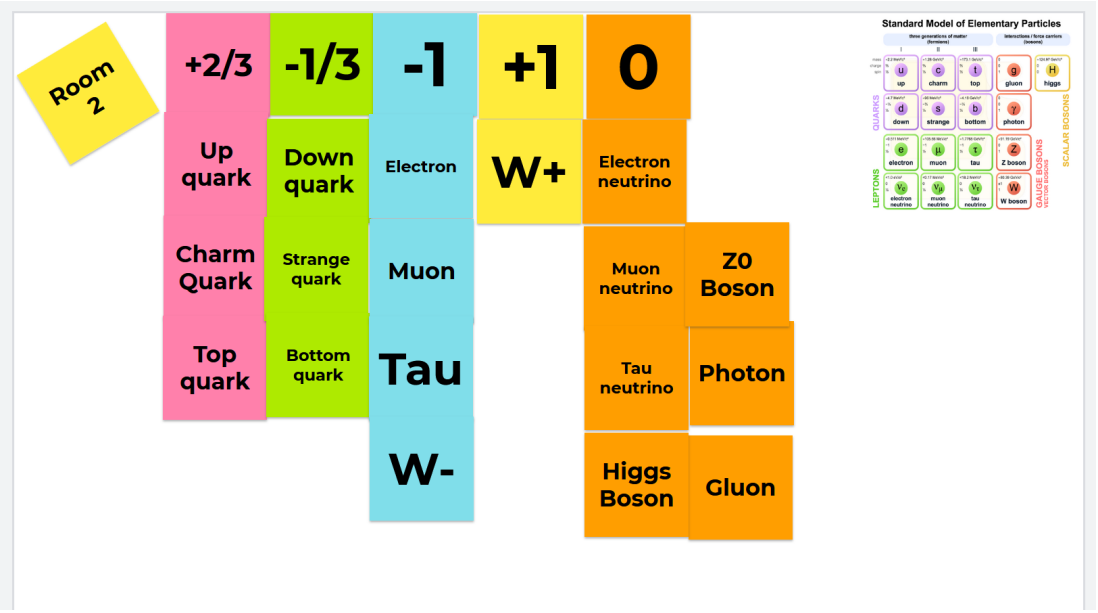
- Depending on the week's load, in my online classes, I start my zoom session with a fun question for students. As students come in, they "join the conversation".
- For simple use like this, this works seamlessly.



Example 2: Education – Breakout rooms

- I use jamboards for zoom breakout room sessions for active group learning for my physics topics.
- Depending on the exercise, each group can get their own “jamboard frame” and we may discuss as the whole class once rooms are closed.

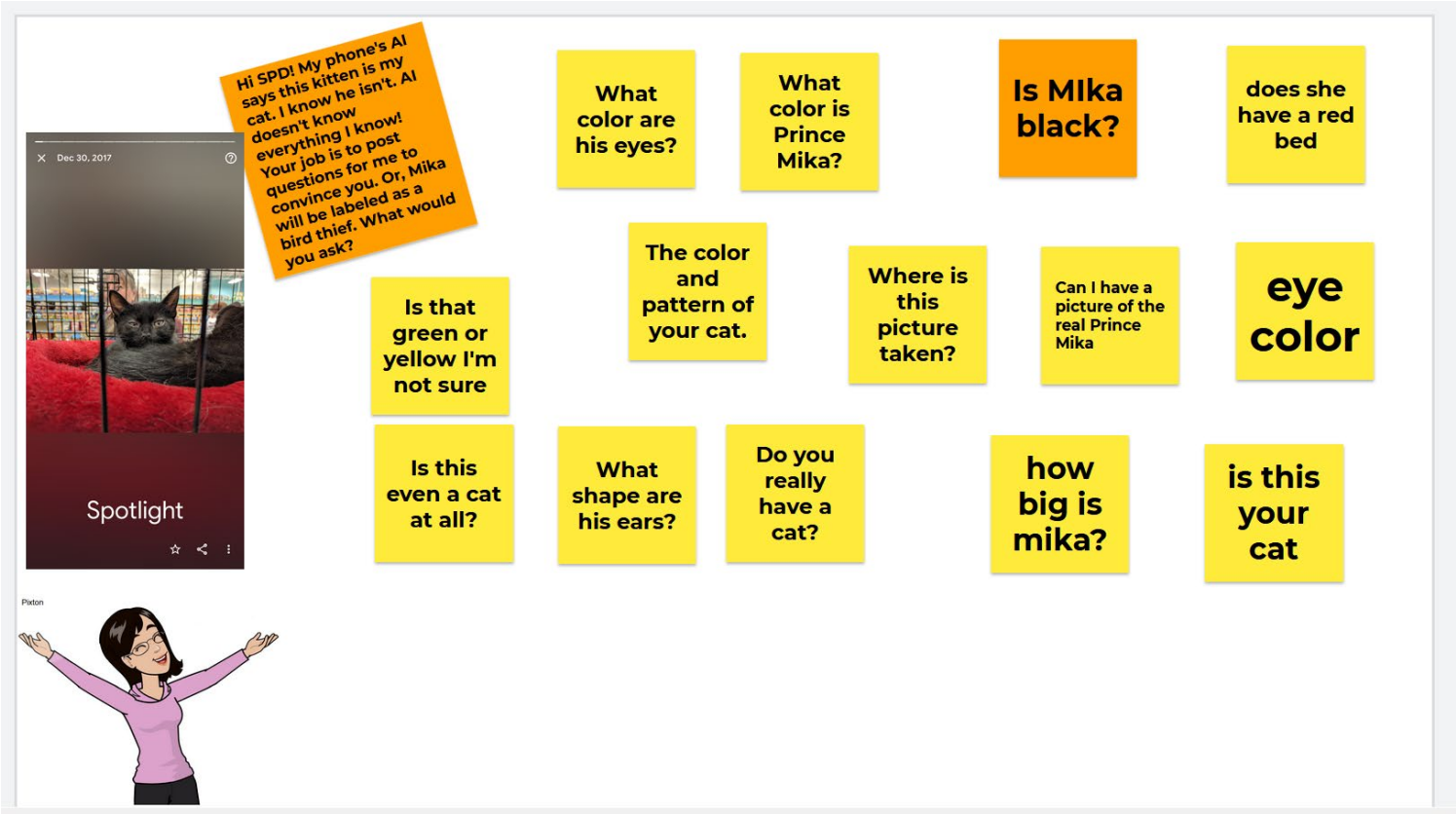




A “prompt” frame and a group frame for in-class active learning exercise

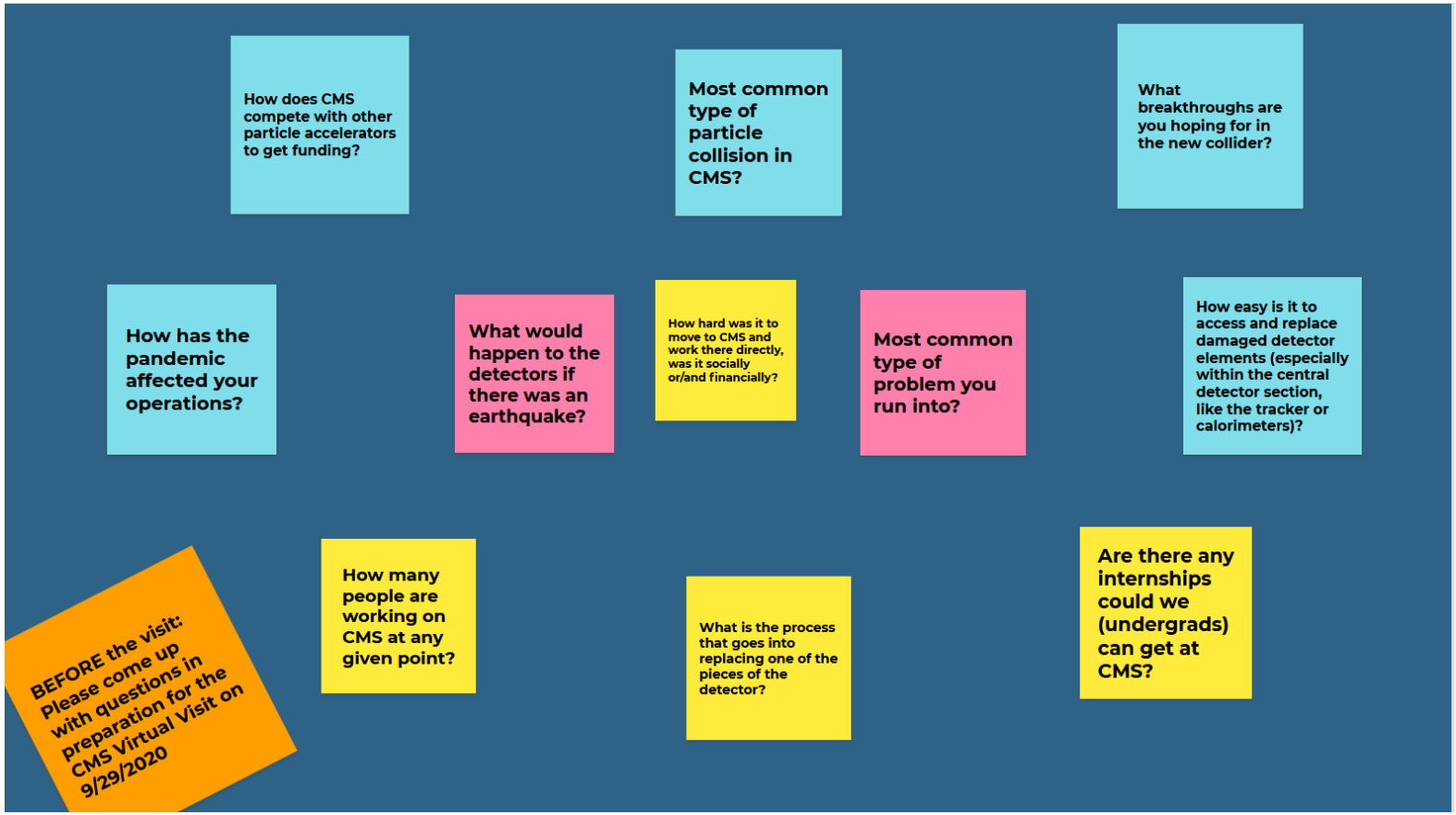
Example 3: Research – Whole class

- Sometimes I simply use one jamboard frame for a whole class research activity.



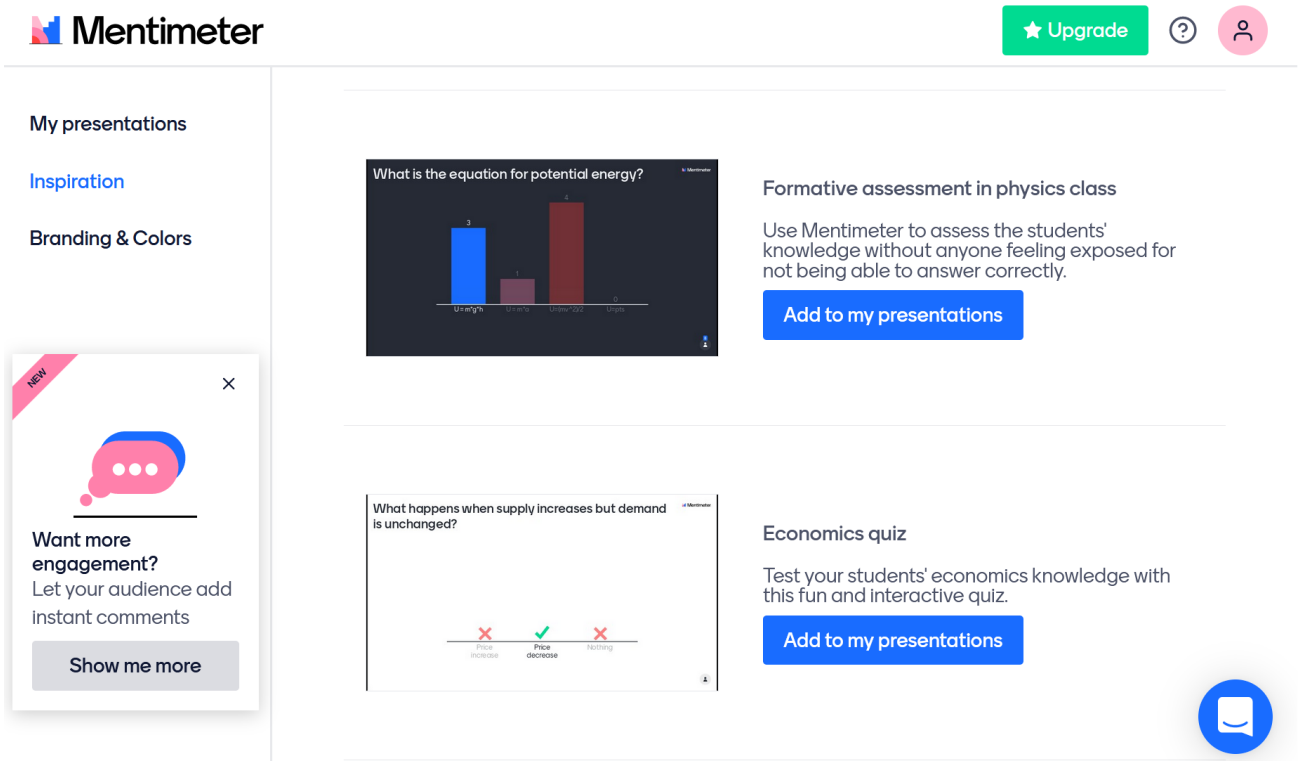
Example 4: Pre-class Exercise

- Jamboards are great for flipped-learning. Students can learn the material and do the exercise before class, ready for discussion.



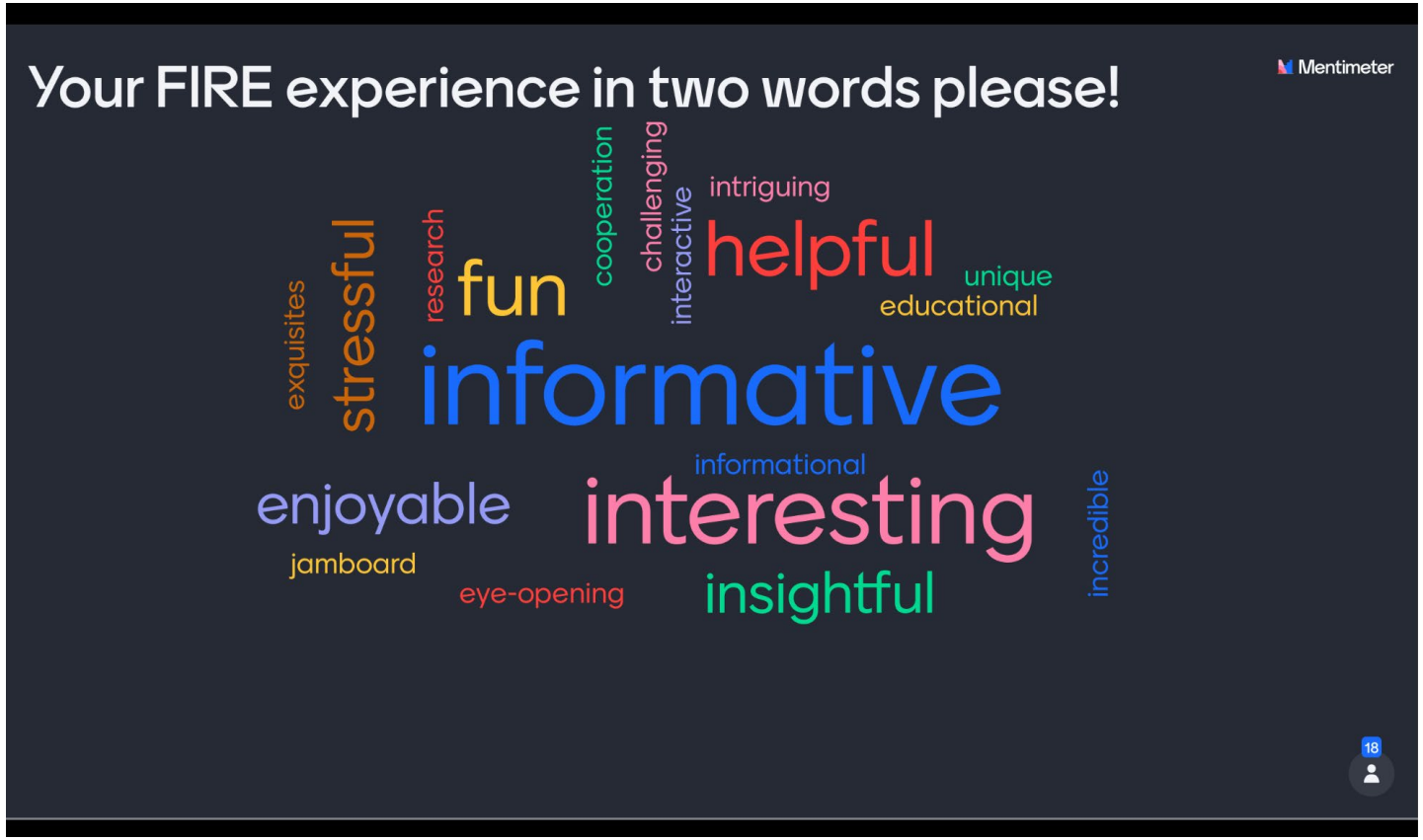
Tool 2: Mentimeter

- Mentimeter lets you create, store and share interactive presentations for polls, quizzes, etc.
- Very easy to run in-class and fun (much better than poll-everywhere)
- Some cons:
  - Free version is good for sharing with an audience on the spot, but not very easily accessible to students.
  - For many slides/ multiple questions, stragglers may have a hard time keeping up.



Example: Feedback word-cloud

- So far, I have only used menti for my end-of-course feedbacks. Anonymity gives students a chance to be open and sincere!



Conclusions

- Teaching a research course, I find it powerful to add active-learning components in my classes.
- Today's internet technology gives instructors the freedom and possibility to use and apply in-class/virtual synchronous tools for various purposes.
- Every tool has its strength and weaknesses, so user should pick what works best.
- I will continue exploring tools in active physics teaching/research courses.
- I will continue using some of the tools mentioned when in-person, but probably not as extensively. Nothing really replaces face-to-face student-teacher interaction in the classroom!

Any questions/comments?

- Please feel free to drop your questions and comments on this jamboard (anonymous) ☺
- Please also feel free to email *mkaragoz@umd.edu*.
- Thank you!

Acknowledgements: UMD FIRE, UMD Physics and UMD CMS groups. My amazing students!