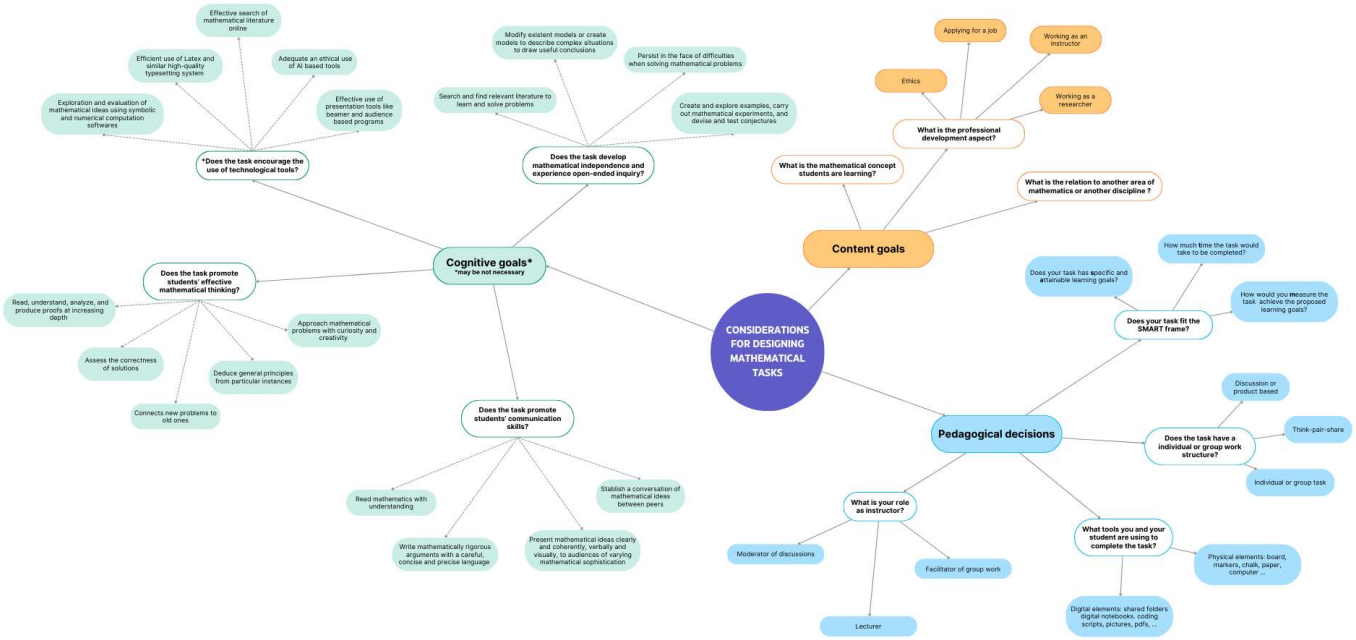
Astrid A. Olave H. October 4th

My framework



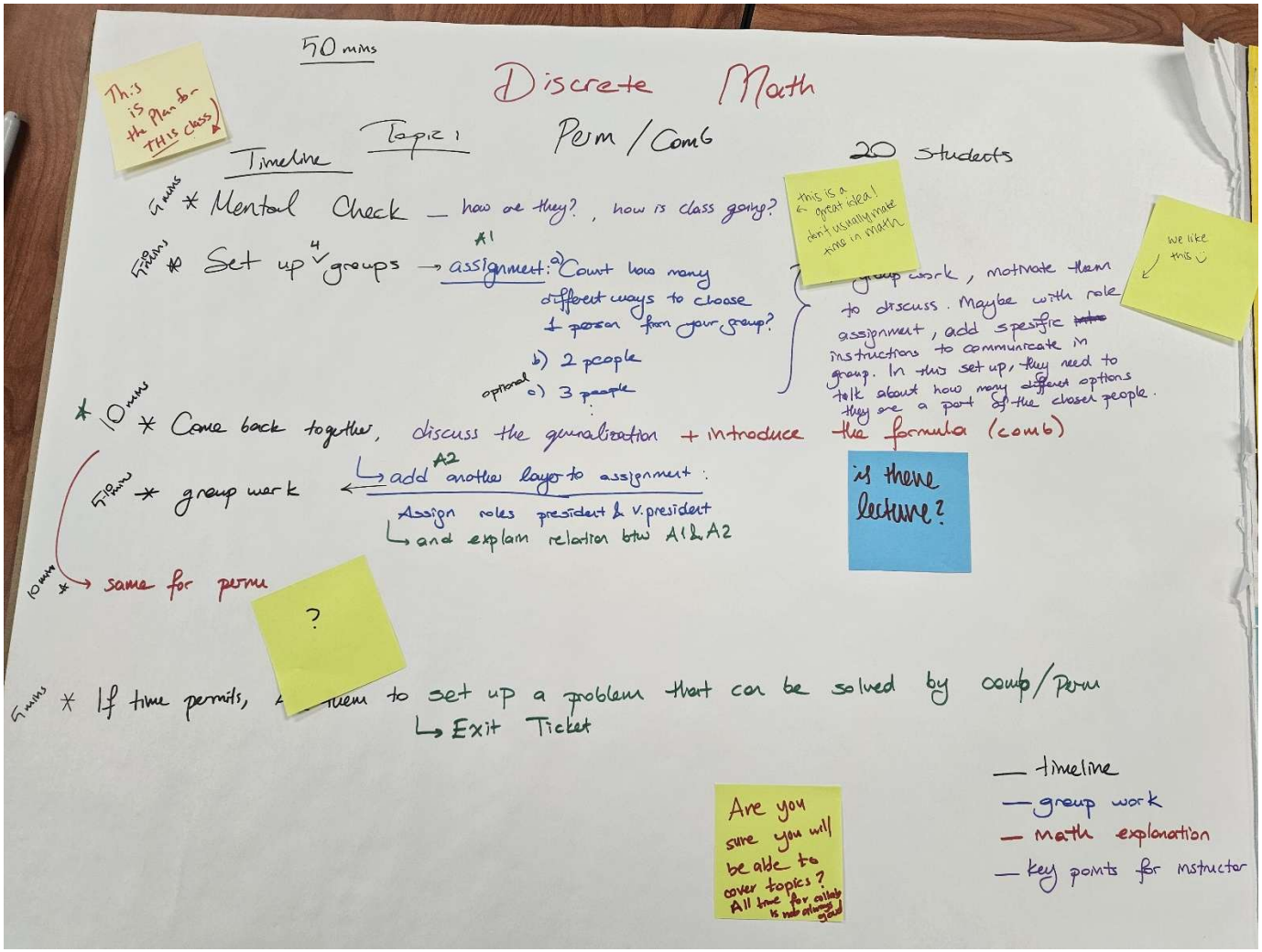
https://www.canva.com/design/DAGSbzmWC0o/m5KJ8oNpCV0to3NyOovLUA/view?utm_content=DAGSbzmWC0o&utm_campaign=designshare&utm_medium=link&utm_source=editor

My framework is mostly based on the cognitive and content goals presented in the Overview chapter of the *2015 CUPM Curriculum Guide to Majors in the Mathematical Sciences*[1]. The pedagogical decisions are based on personal experiences and the readings and discussions we have had in the classroom. In particular the Guide to Evidence-Based Instructional Practices in Undergraduate Mathematics[2]

[1] Mathematical Association of America (MAA) (2015). *2015 CUPM Curriculum Guide to Majors in the Mathematical Sciences*. Available at https://maa.org/wp-content/uploads/2024/06/2015-CUPM-Curriculum-Guide.pdf (pdf)

[2] The Book Study Guide for The MAA Instructional Practices Guide (2020) by Emily Braley, Priscilla Bremser, Matt DeLong, Aimee J. Ellington, Gulden Karakok, Krystina K. Leganza, Jessica M. Libertini & Erica R. Miller is licensed under CC BY-NC 4.0.

Task being seen through my framework



The task takes a 50 minute class to teach combinations and permutations. It starts with a mental check. Continues with a group wok of 5 minutes where students count how many ways they have to choose, 1 , 2 , 3 groupings from their group. The class gets together to discuss the formula. The process is repeated to learn permutations. This time the groupings have an order. At the end, students should set up a problem that can be solved using combinations or permutations.

Astrid A. Olave H. October 4th

The task fits pretty well in all the branches of my framework. Let us describe them explicitly. *In italics are the possible improvements*

Content goals

The mathematical concept the students are learning is "combinations and permutations without repetition" from the area of discrete mathematics, which is a basic and opening concept in this area.

The task does not relate with professional development or other areas explicitly. *It would be an improvement if the assignment on the group work does involve other mathematical objects from algebra or is based on a real case scenario*.

Pedagogical decisions

- The task has a mixed between group work, discussion with the whole class and lecture. Thus, the instructor has a role of lecturer and facilitator. An important bit the task considered are the rules to work in a group.

- The task does not have a specific set of tools. *It is important that the task considers explicitly all the elements needed for the lesson*. Even though no lesson can be 100% choreographed, it is necessary to plan the task with most details as possible.

- The task is **specific,** has an **attainable goal,** an amount of **time of one class** and a **measurement** of comprehension trough an exit ticket.

The framework can be feed with more pedagogical decisions, but I am unaware of another general ones.

Cognitive goals

- The task develops the communication skill of "stablishing a conversation of mathematical ideas between peers". If the students took an introductory class to proofs, the task can be enriched by asking students to *write their conclusions in a mathematical stylish way*. If the time permitted, even a *presentation of ideas between groups*.

- The task can promote the deduction of general principles from particular instances as they *can be encouraged to deduce the combination formula from the counting assignment, as well as the permutation formula*.

- The task does not need any technological tool, and I think is okay.

- The task develop mathematical independency since the student is asked to create and explore examples, carry out mathematical experiments, and devise and test conjectures.