Harnessing the Power of Technology

to facilitate a creative approach to improve student engagement and assessment

OCMA

October 26, 2021



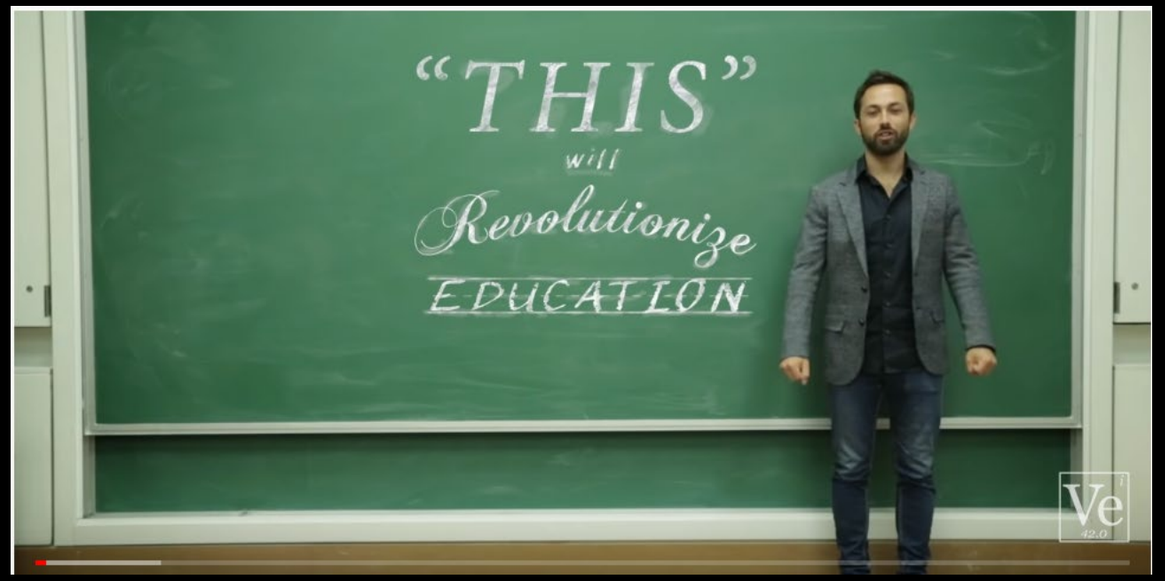
Frosina Stojanovska-Pocuca

What a year it has been!

- Deployed Technology to help teachers build adequate and effective techniques

  - ✓ Bridging the gap between Pedagogy and Technology

  - ✓ Be used as part of synchronous/ asynchronous lectures/tutorials

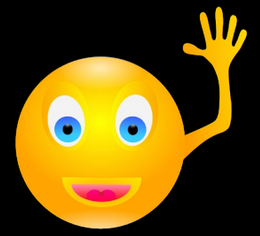


https://www.youtube.com/watch?v=GEmuEWjHr5c

  - ✓ Inclusive technology practices in teaching, learning and assessment can benefit all students

What a year it has been!

- How to Engage our students?
- How to Assess their acquired knowledge?



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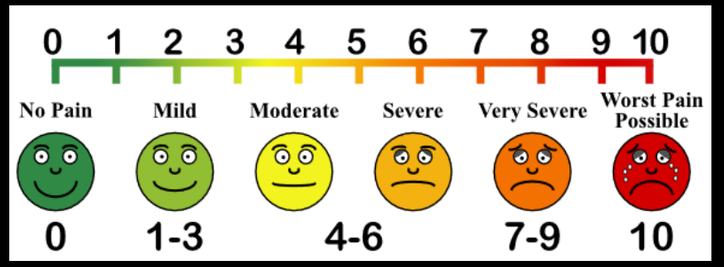
- ✓ Instigate a Culture of Learning;
- ✓ Provide ongoing, merciless support;
- ✓ No proctoring;



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Disclaimer:

The strategies presented here today are not new, and they may be already in your toolbox.

- Before we started
  - ✓ Survey
  - ✓ Course Content
    - Delivery and Assessments
      - ✓ Brain Brakes
      - ✓ Learning Strategies
      - ✓ About Assessments
      - ✓ Participation
      - ✓ Math Escape Room



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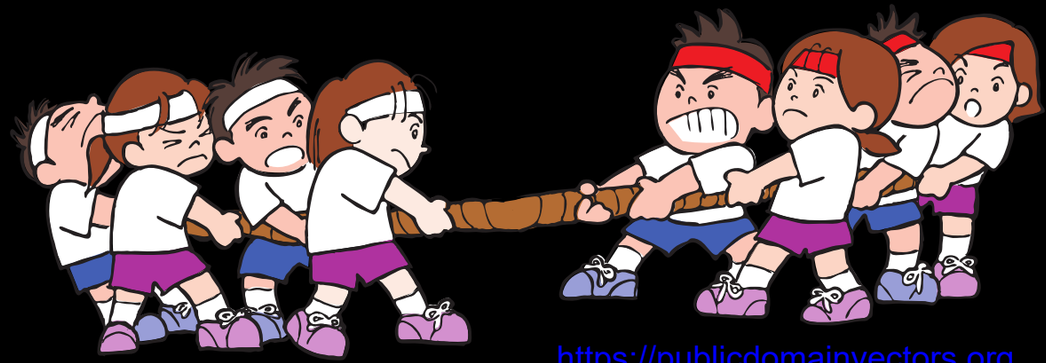
I hope this presentation inspires upon an activity or an inquiry that you may bring to your students.

About my Students…

- First year Computer Science (Software and Networking)
- Different strategies:
  - ✓ Surveys;
  - ✓ Recording mini-lectures
  - ✓ Reflective assessments
  - ✓ Open book exams with questions that require more critical and analytical way to answer
  - ✓ Additional opportunities to show what they learned



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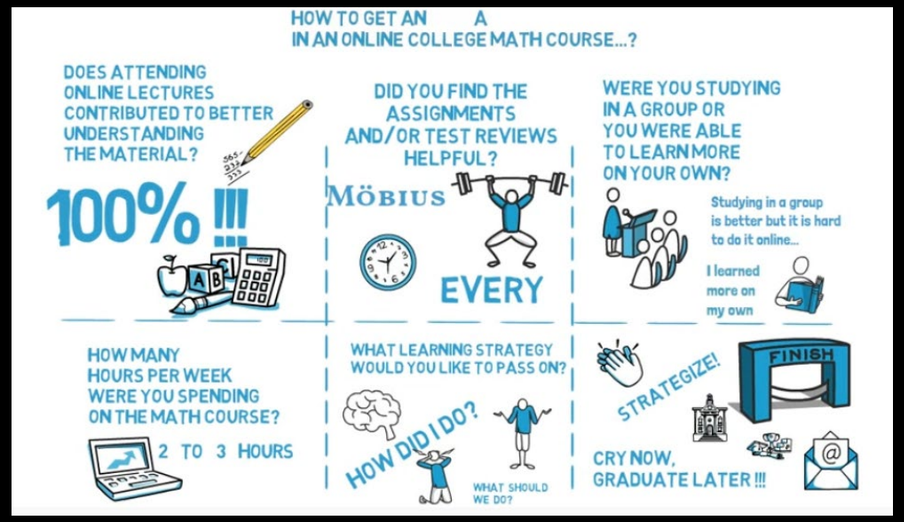
Before we started…

- ❑ Summer 2020:
  A survey to students who scored 90+ on Test 1

- ✓ Would you like to share some strategies on how you made those great results and what would you like to say to the incoming students.



https://www.youtube.com/watch?v=yJoqI0M9HEI

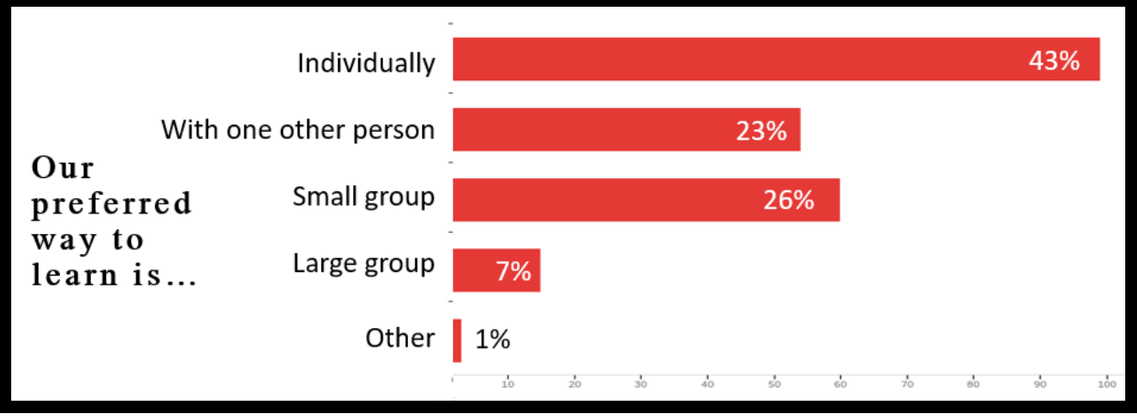
"My learning strategy depended heavily on attending lectures and writing the assignments multiple times. The "How did I do?" button was a good friend to me."

"Doing the assignments as soon as they opened. ..."

"Attending classes was most definitely the fastest way for me to learn. I had a pencil, paper, and calculator always with ..."

First Survey

- During week 1, a survey is sent to students to get to know them better…

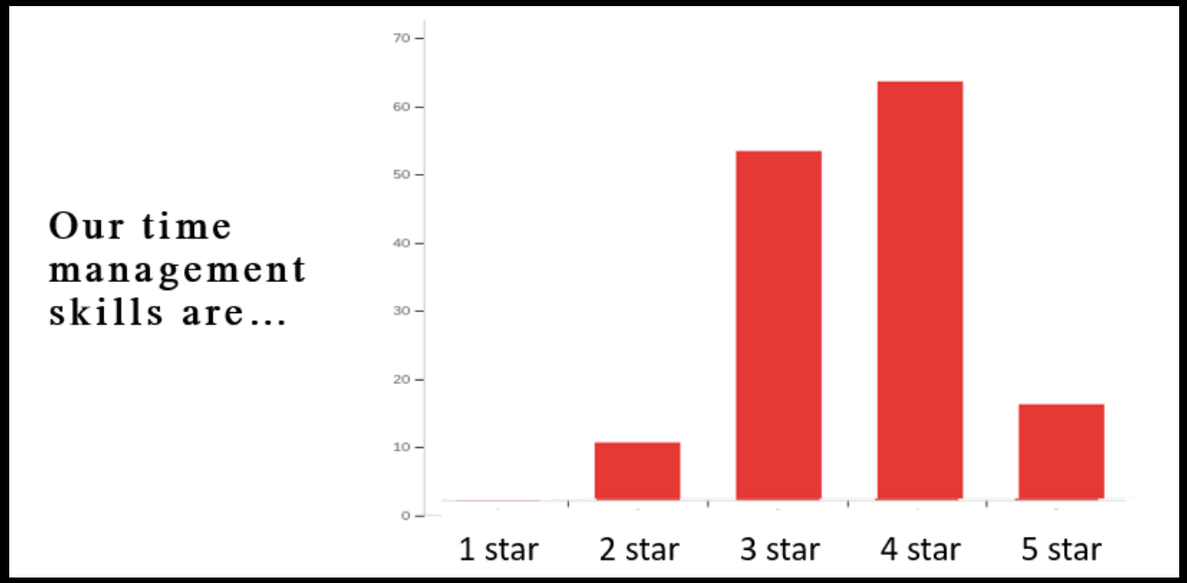


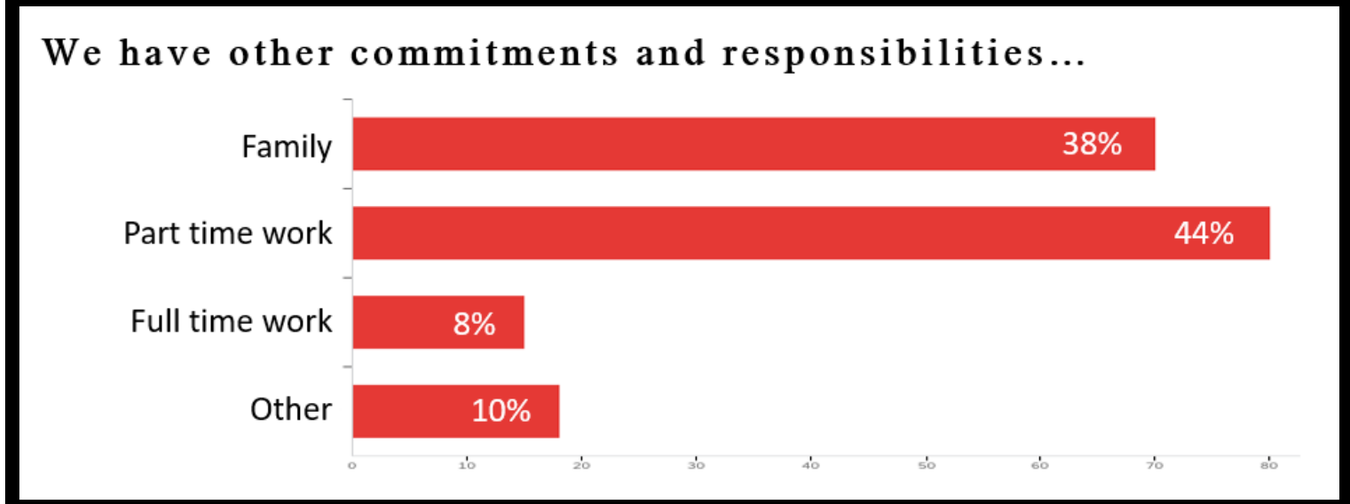
Attending online lectures are…

An average of 93.5%

Hours planned for weekly homework are…

An average of 5.2 hours





First Survey

➢**Expectations from the teacher**

- To be understanding, accepting, and to treat their students with respect.
- To be patient, approachable and accessible.
- To explore different solutions to problems or engage the class in different ways.
- To provide a positive interactive experience in a stress-free environment.
- To accurately present material, and to be approachable with questions and concerns if needed.

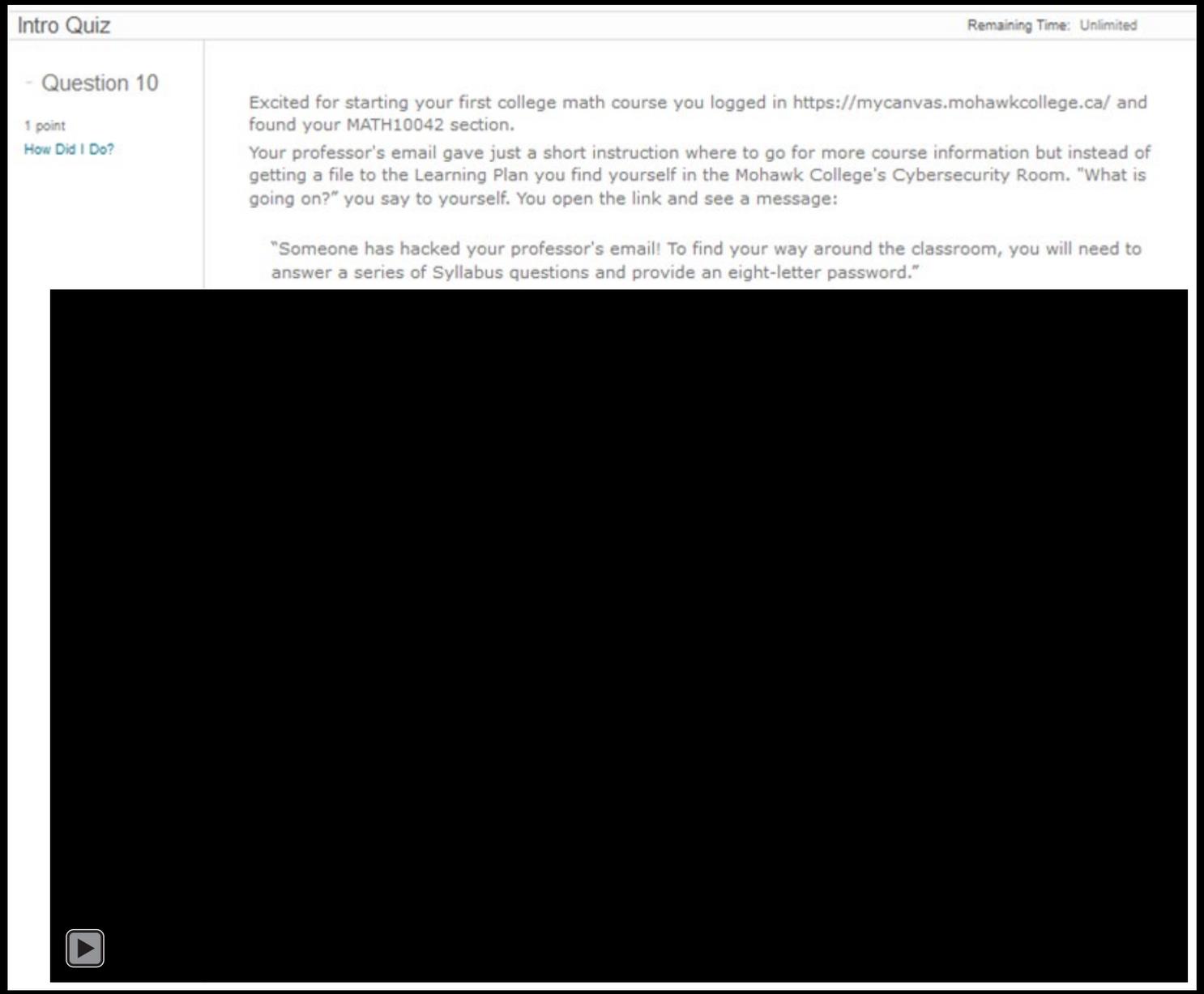
➢**Expectations from students**

- Come to our online class - if you miss a class, ask a friend for notes, check MyCanvas what was covered;
- Ask for help as soon as needed:
  - ask the teacher for help with concrete questions;
  - book an online appointment with our Student Success Mentors for some extra support!
- Be open for learning, apply yourself;
- Work on the homework more frequently during the week;
- Start working on Mobius Assignments as soon as they open;
- When in doubt, send me an email/ask in class.

Course Content

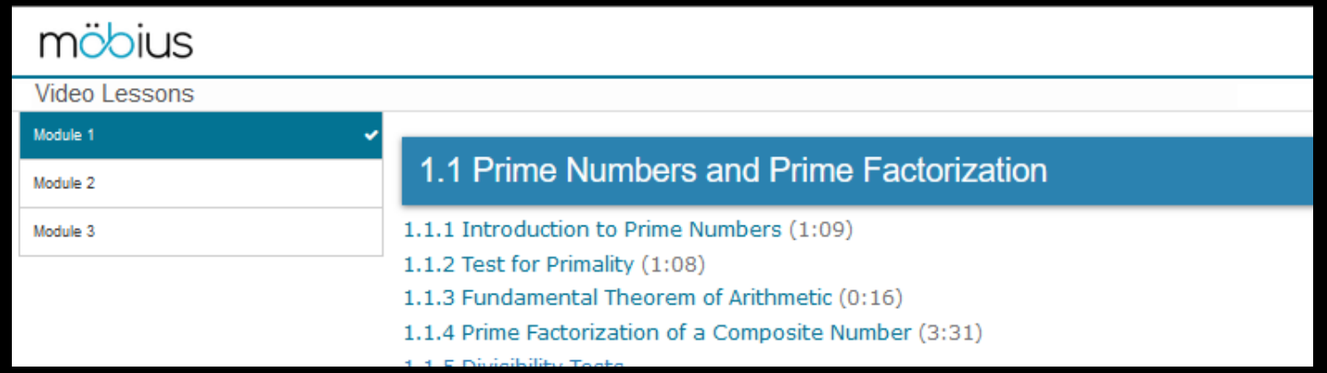
- It is on the Syllabus!

- ✓ Helps you know what to expect from the course during the semester
- ✓ How about a Quiz?

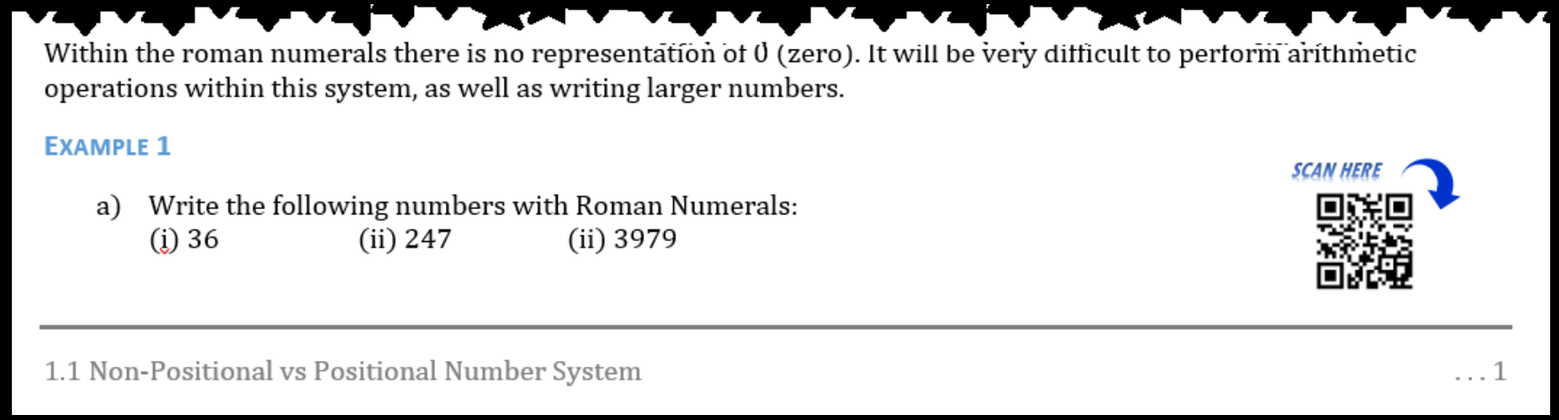


Course Content

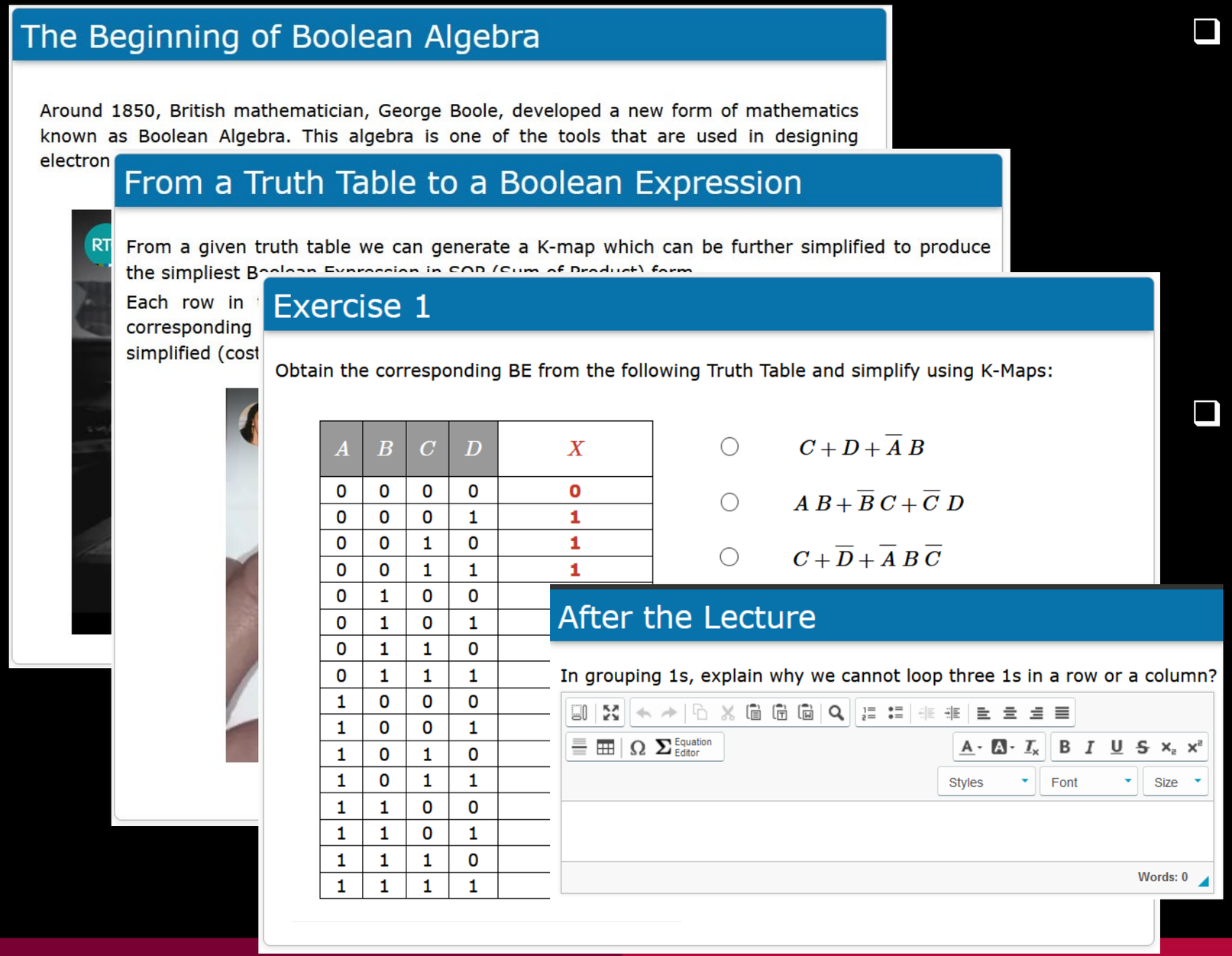
- Roadmap;



- Universal Design of Learning;



Microlecture Approach



- Provide guided questions with increasing difficulties;
  - ✓ Not knowing is not a pleasant feeling.
- After the lecture:
  - ✓ Where do you think a student may make a mistake?
  - ✓ What do you think your teacher may ask on the test?



MATH10042

Mathematics for Computer Studies

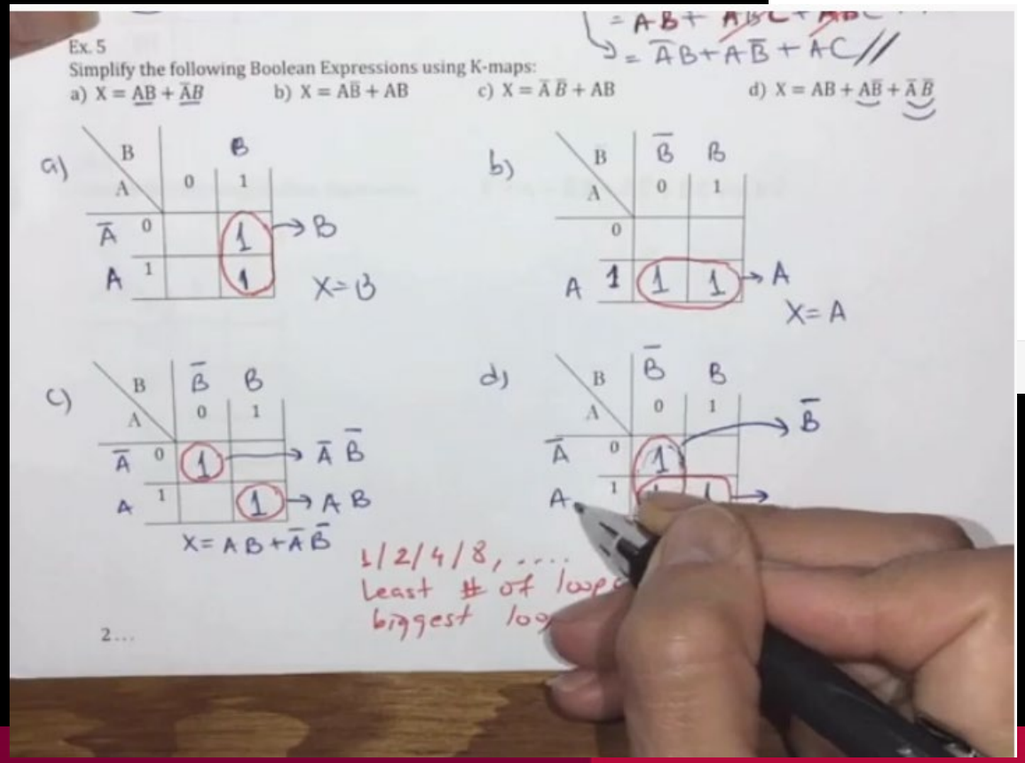
with Frosina Stojanovska-Pocuca

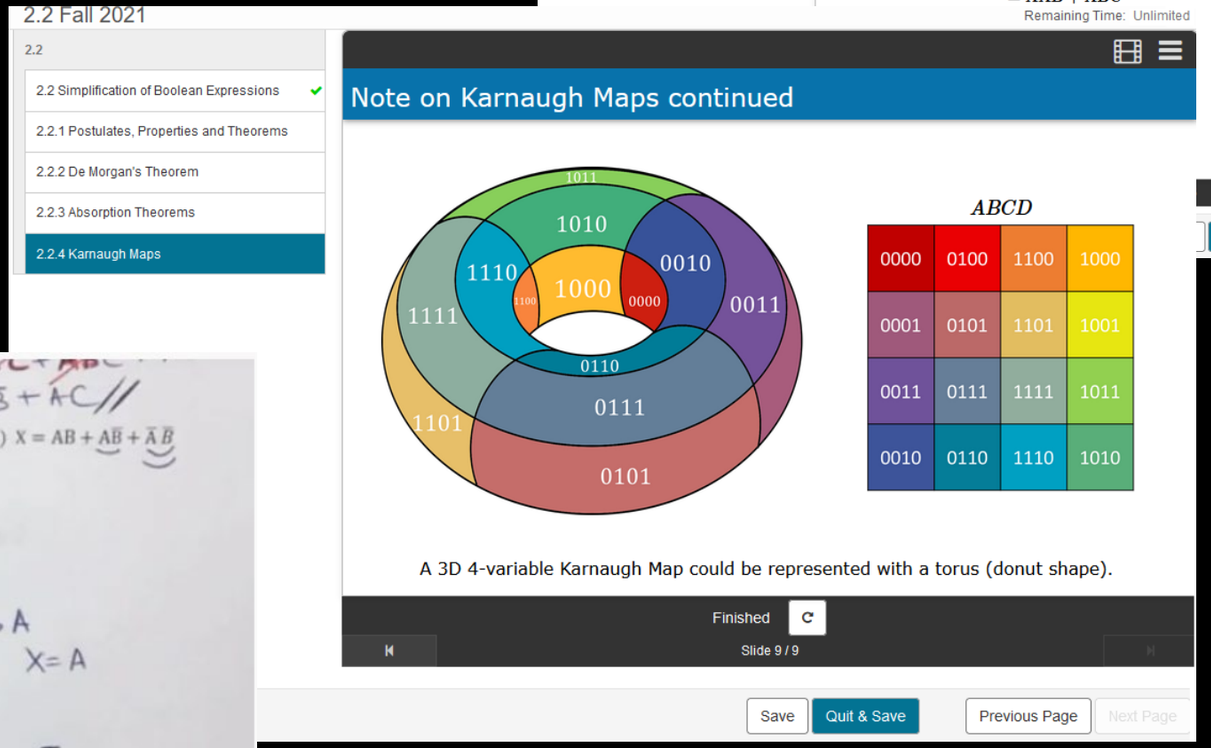
Are your pencils sharpened? Class is starting soon!

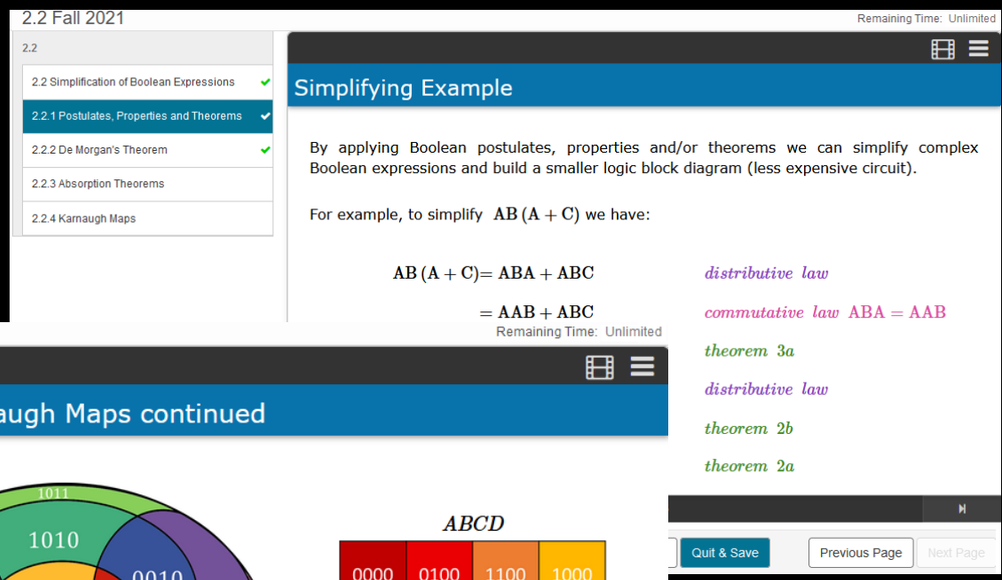
Music: https://www.bensound.com

Online Classes

- ✓ Two 2-hour lectures;
- ✓ Microlecture;
- ✓ Same Worksheets;
- ✓ Document Camera;







Online Classes

- ✓ Two 2-hour lectures;
- ✓ Microlecture;
- ✓ Same Worksheets;
- ✓ Document Camera;
- ✓ Chat;
- ✓ Polls;



https://mathigon.org/timeline

http://radio.garden

1. How is class going so far?

- I can follow along well.
- I have troubles with some of the questions.
- I have no clue what is going on...



Which of the following is true?

- All of the below
- None of the below
- All of the above
- One of the above
- None of the above
- None of the above



https://www.amazon.ca/

Brain Breaks

- A video insert from a talk given by Dylan Beattie at NDC London, 2020

"… Code created just to make people smile, laugh, …. or created just to see if it was possible?..."

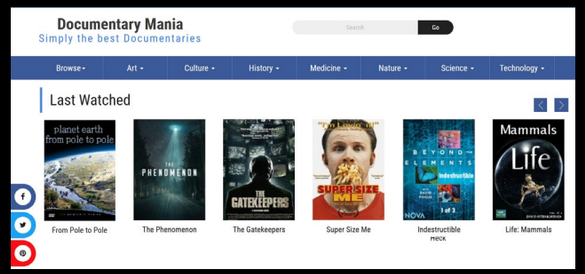


The Art of Code – Dylan Beattie

http://www.youtube.com/watch?v=6avJHaC3C2U

Brain Breaks

- A video clip from a movie presenting mathematics as a building block for their own program area;



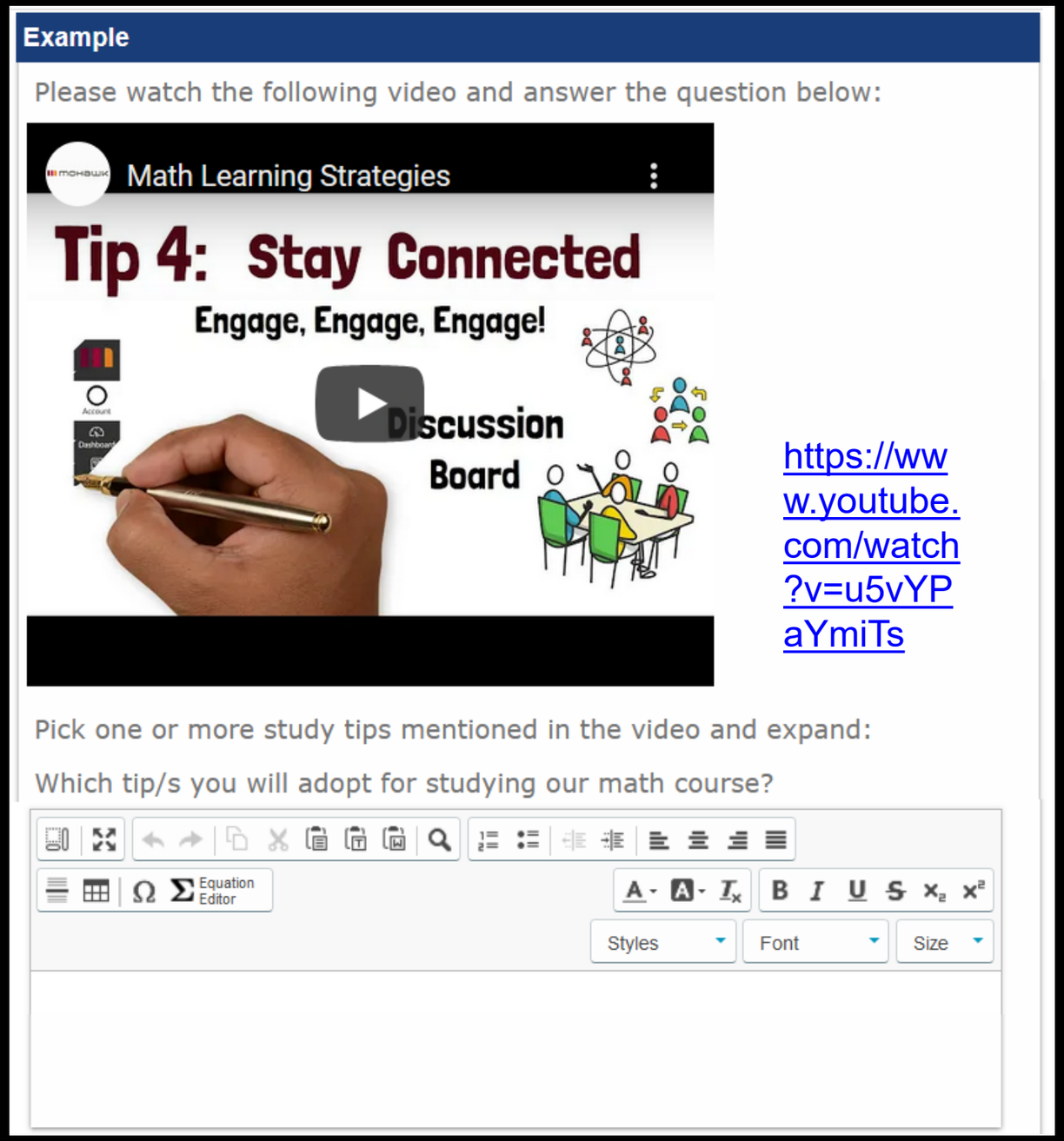
[The Bit Player - Documentary Mania]

http://www.documentarymania.com/player.php?title=The+Bit+Player

Learning Strategies

Included in an Assignment

- Identify some strategies that may be used.
- After Test 1 students are asked
  - ✓ If they used the strategies and if they helped;
  - ✓ Which steps can be taken going forward.

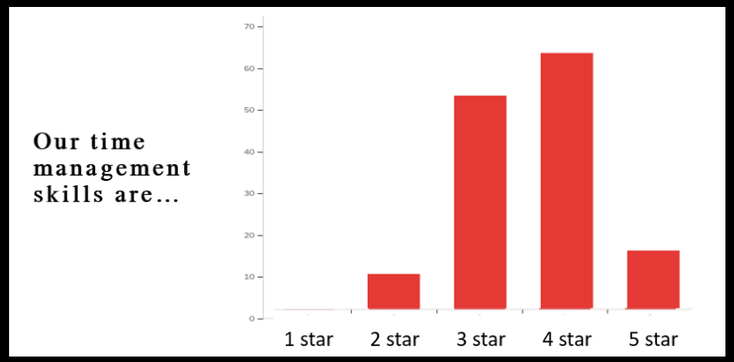


Learning Strategies

- Top 3:

1. Manage your Time
2. Master your Environment
3. Take Notes

9. Eliminate Distractions



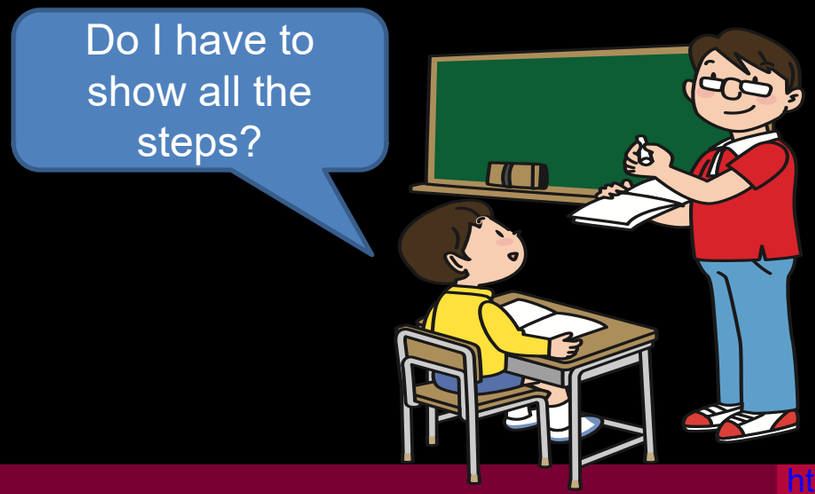
- After Test 1

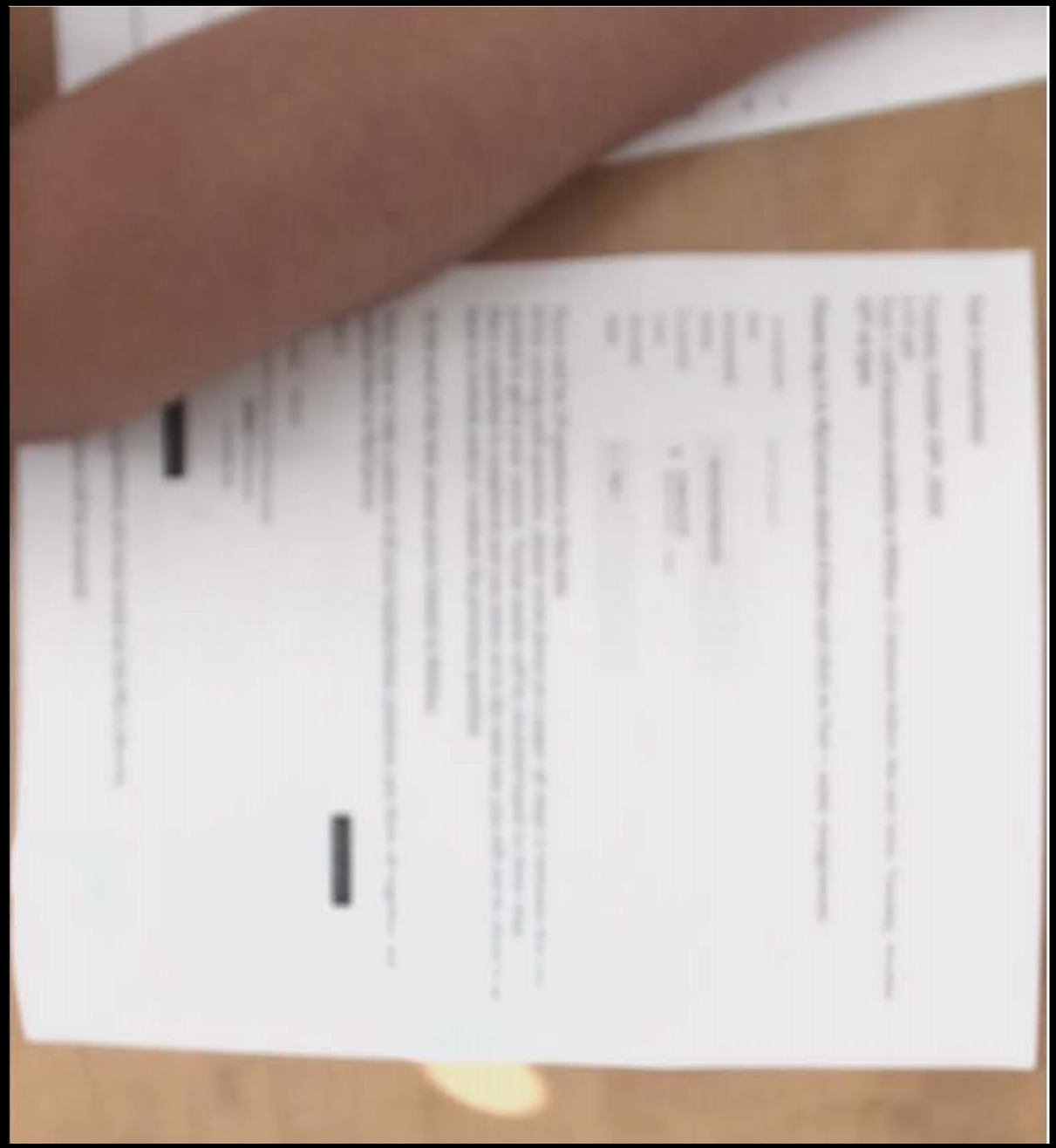
	Master the Environment	29%
3	Manage your Time	71%
	Assemble your Resources	69%
	Stay Connected	43%
	Demonstrate Self-Motivation	50%
1	Take Notes	93%
	Stay Healthy	58%
	Embrace the Failure	39%
2	Eliminate Distractions	78%
	Reward Yourself	41%

About Instructions

- Handwritten solutions were required to be uploaded to Dropbox

"…I posted a file with instructions on Test 1 under Assessments/Test1 in MyCanvas. Take a moment and review it before our class today and we can further discuss the test requirements and recommendations…."





About Assessments

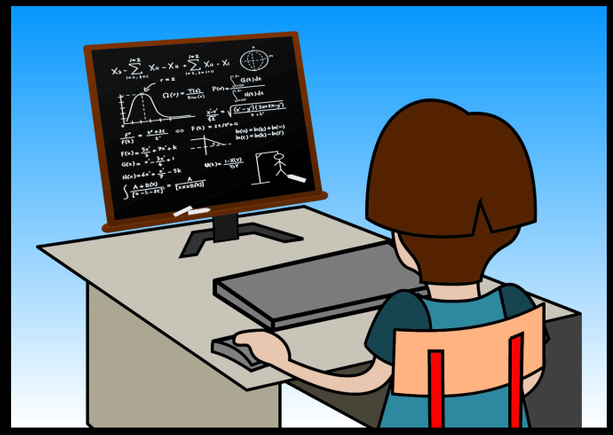
- What do we assess

  and how do we asses?

> "What and how students learn depends to a major extent on how they think they will be assessed." - John Biggs

The long-term goal is to create healthier study habits with students where they recognize assessments as important learning opportunities.

- Poll 1:
  - ✓ Discussions;
  - ✓ Quizzes;
  - ✓ Assignments;
  - ✓ Tests/Exams;
  - ✓ Oral Assessments;
  - ✓ Proctored Assessments;
  - ✓ Open Book Assessments;
  - ✓ Group Work;
  - ✓ Lab Reports/Research Projects;
  - ✓ Video/In-person Presentations;



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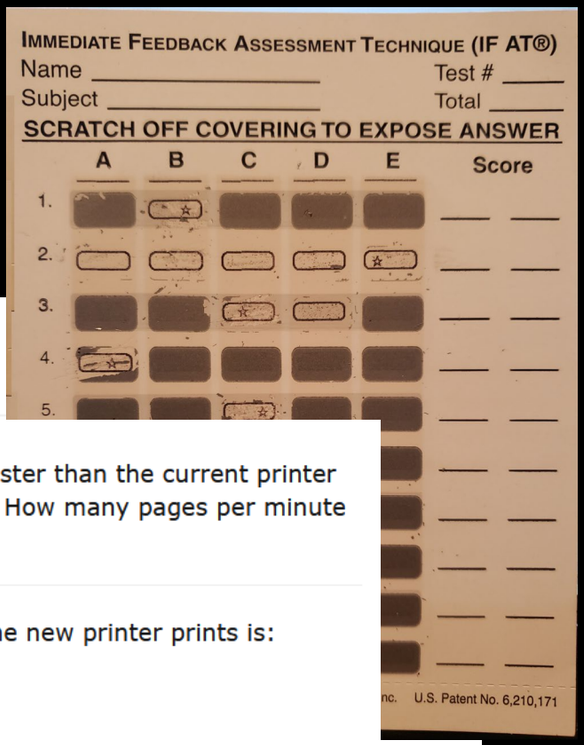
Quizzes

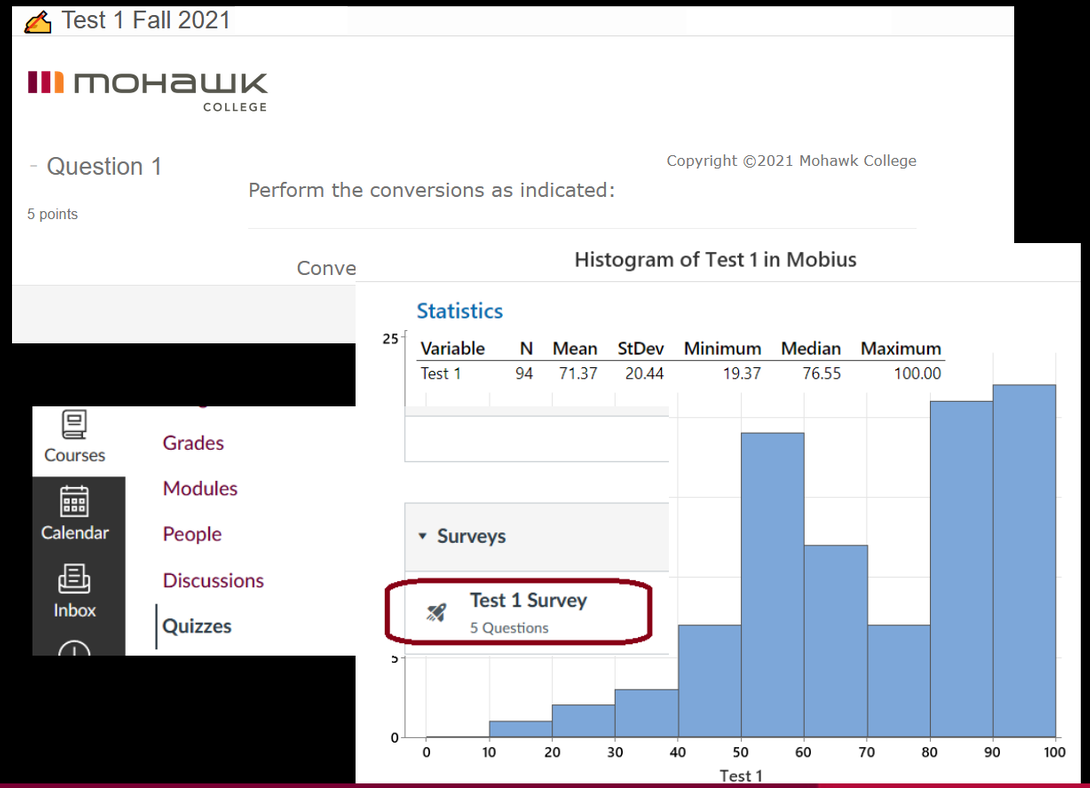
- SAE – Short Answer with Explanation
- MCE – Multiple Choice with Explanation

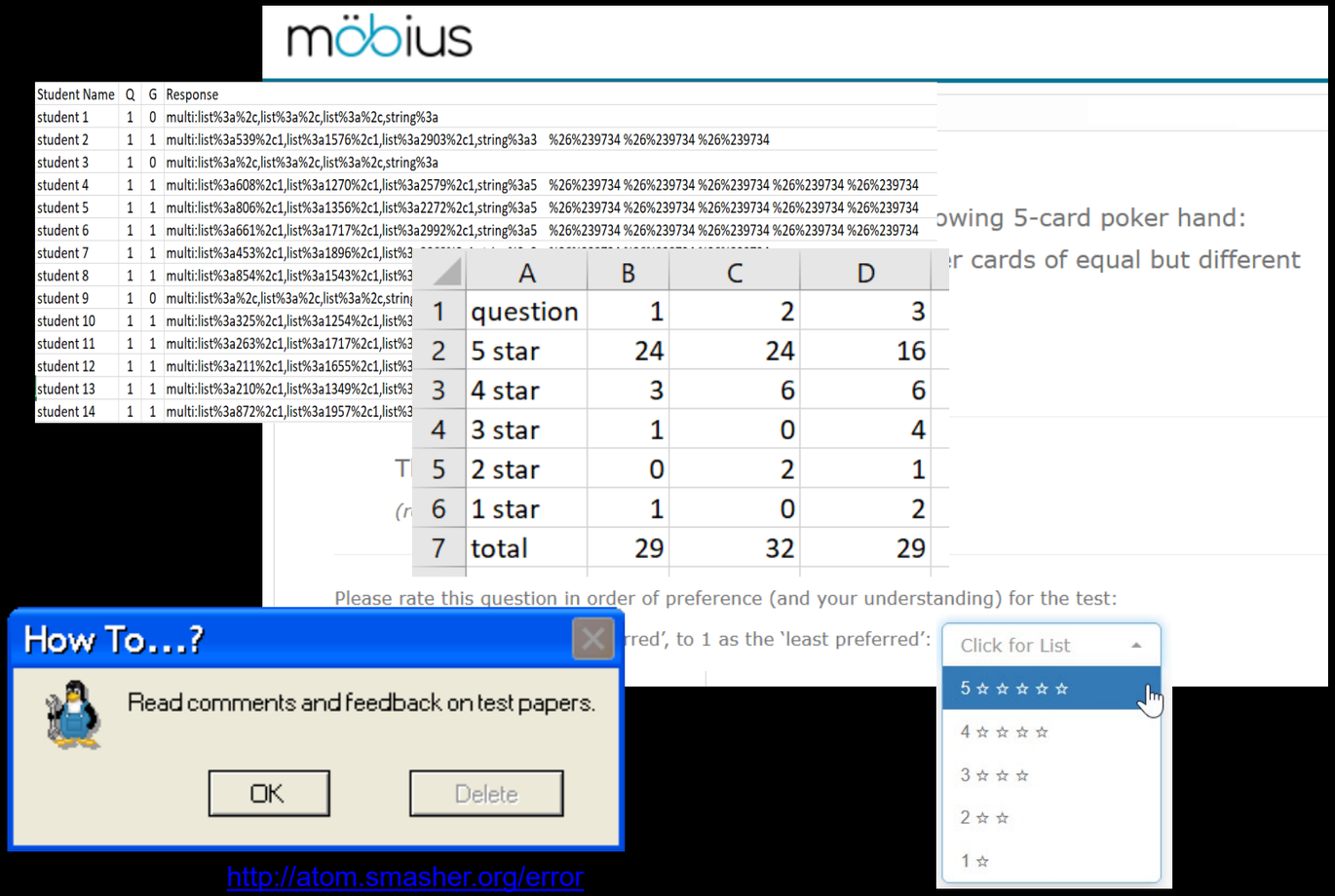
- ✓ Students need to articulate why they chose the method to solve given problem in a certain way or what the solution means in the context.



Tests

- ❑ Students like the feeling when they are given a chance to have an input.
- ❑ Communicate the Results





http://atom.smasher.org/error

- ✓ Read the comments and predict your grade
- ✓ Describe any changes in strategies
- ✓ Top 3: 1. Take Notes
  2. Eliminate Distractions
  3. Manage your Time;

Errors, Feedback and Intrigue

Example

In the following example a common mistake has been made.

Highlight the line where the wrong step was made and describe it. Then, solve the equation properly and provide th correct value for the unknown.

$$
\begin{aligned}
5-3(4x-7) &= -6x \\
2(4x-7) &= -6x \\
8x-14 &= -6x \\
8x+6x &= 14 \\
14x &= 14 \\
x &= \frac{14}{14} \\
x &= 1
\end{aligned}
$$

Correct va

Describe t

Question 1

1 point

How Did I Do?

Remaining "How Did I Do?" Uses: 2/3

Suppose the random variable Z follows a standa

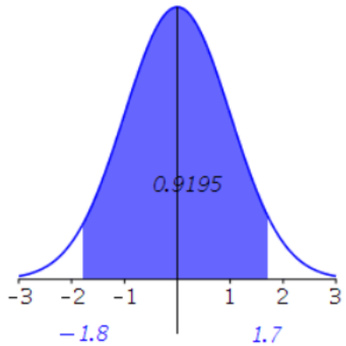
Calculate the area between -1.8 and 1.7.

$P(-1.8 < Z < 1.7) =$ Number

(round your answers to 4 d

Feedback

To find $P(-1.8 < Z < 1.7)$, we need to find the diffe areas under a standard normal curve to the left of 1.7 a -1.8. Using computer software, or approximating with table, we can find this area to be 0.919504. Graphically this as:



Example

Please watch the following video and then answer the question below:



Are there any grounds for appeal? Please explain.

(Were there any mistakes made in solving the equation? Would there be any other valid answers for x ?)

Equation Editor

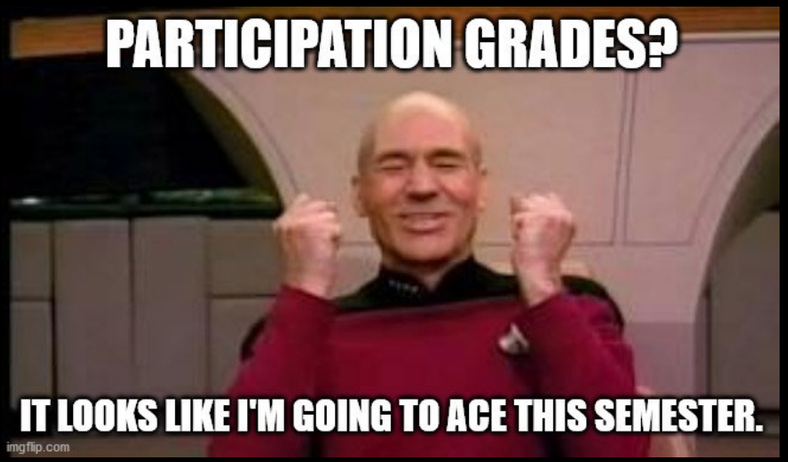
Styles Font Size

Words: 0

Grade Close

Participation

What goes in this grade?

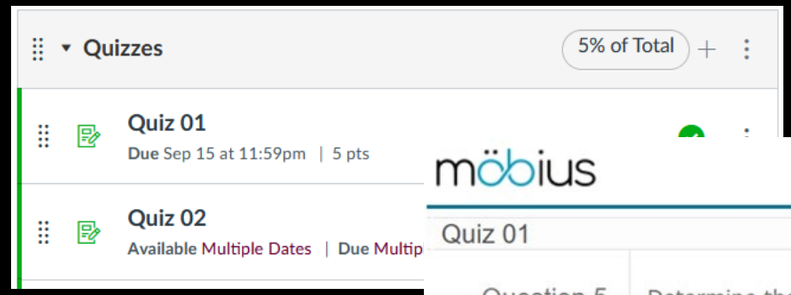


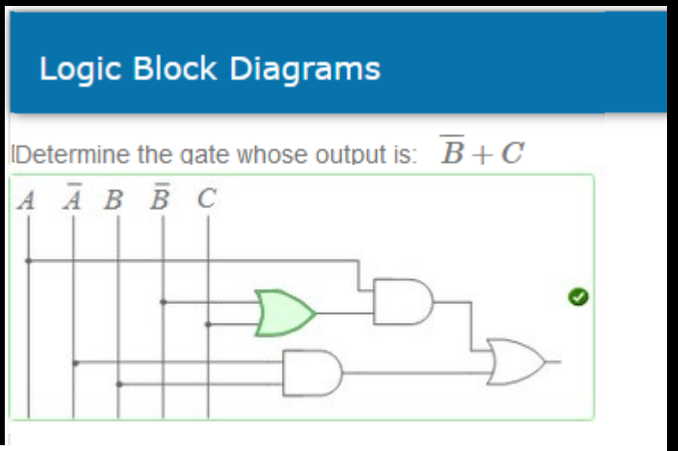
https://imgflip.com/memegenerator

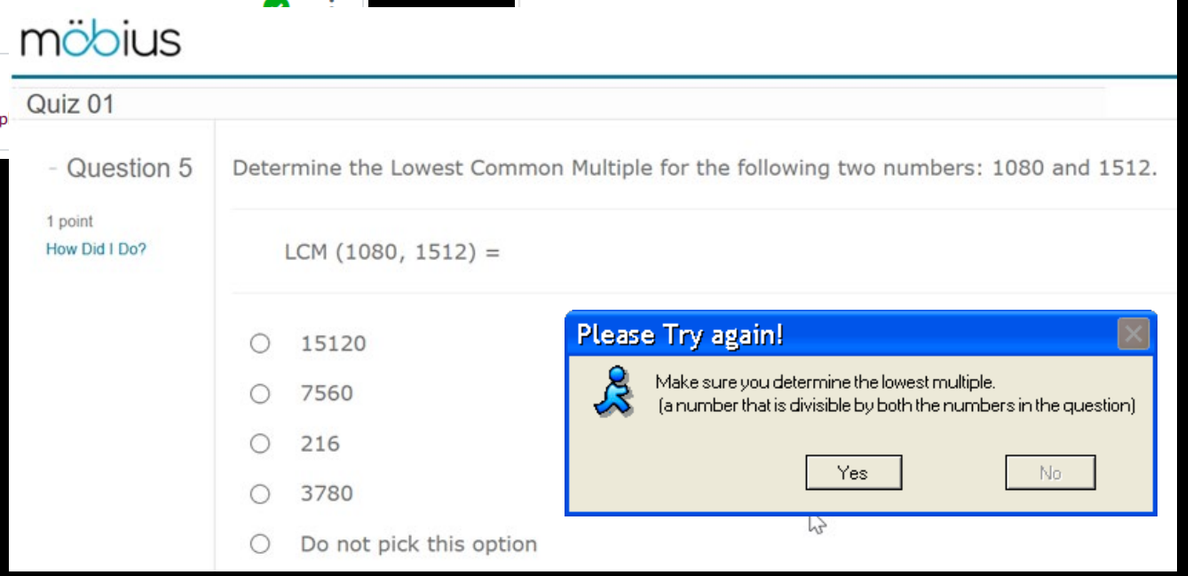
- ❑ Poll 2
  - ✓ attendance to online/in-class lectures/tutorials;
  - ✓ online/in-class quizzes;
  - ✓ online/in-class whole-class or small group discussions;
  - ✓ timely completion of assigned out-of-class work;
  - ✓ LMS discussion boards;
  - ✓ no participation should be graded;

Participation

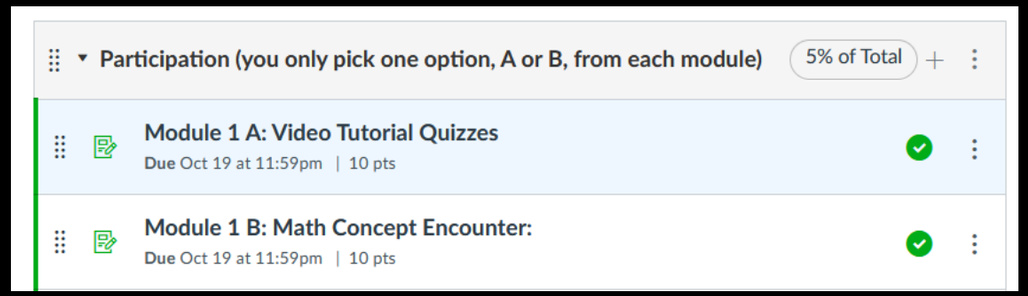
- Quizzes - online;





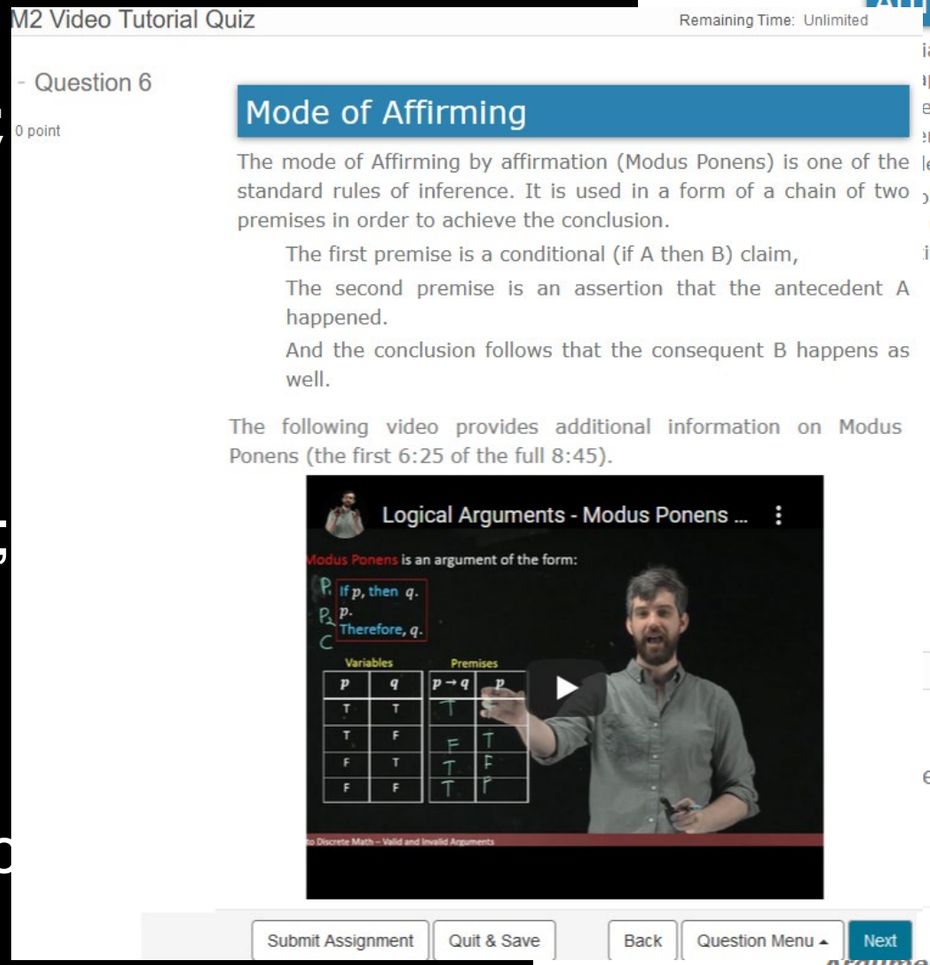


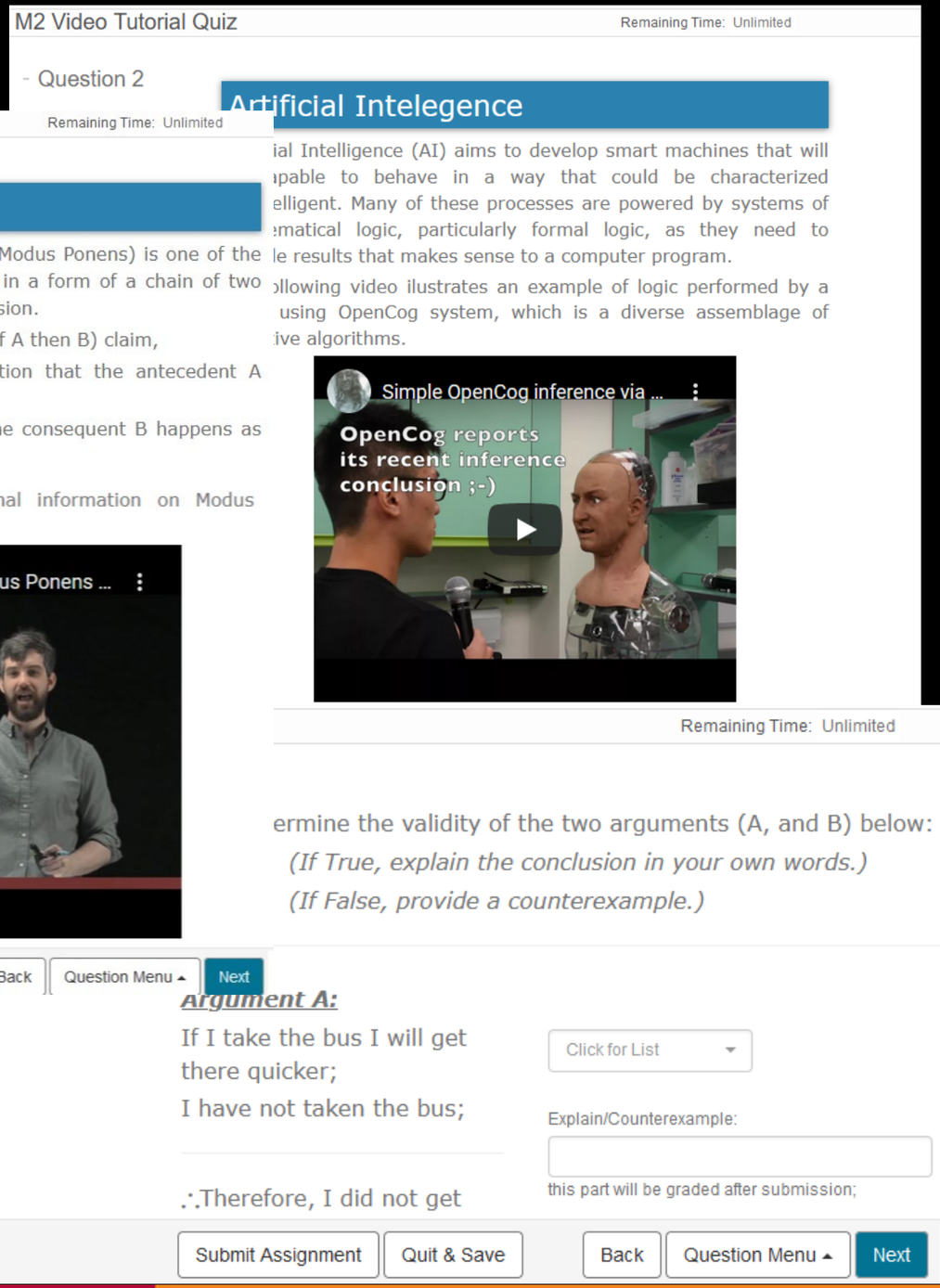
- Participation A or B:
  - ✓ Video Tutorial Quizzes;
  - ✓ Math Concept Encounter;



Participation

- Video Tutorial Quizzes;
  - ✓ Watch a math video on particular topic;
  - ✓ Complete an online quiz;
  - ✓ Each of the quizzes contains multiple choice questions about the topic explained in the video.
  - ✓ Full solutions required for 1 or 2 questions.

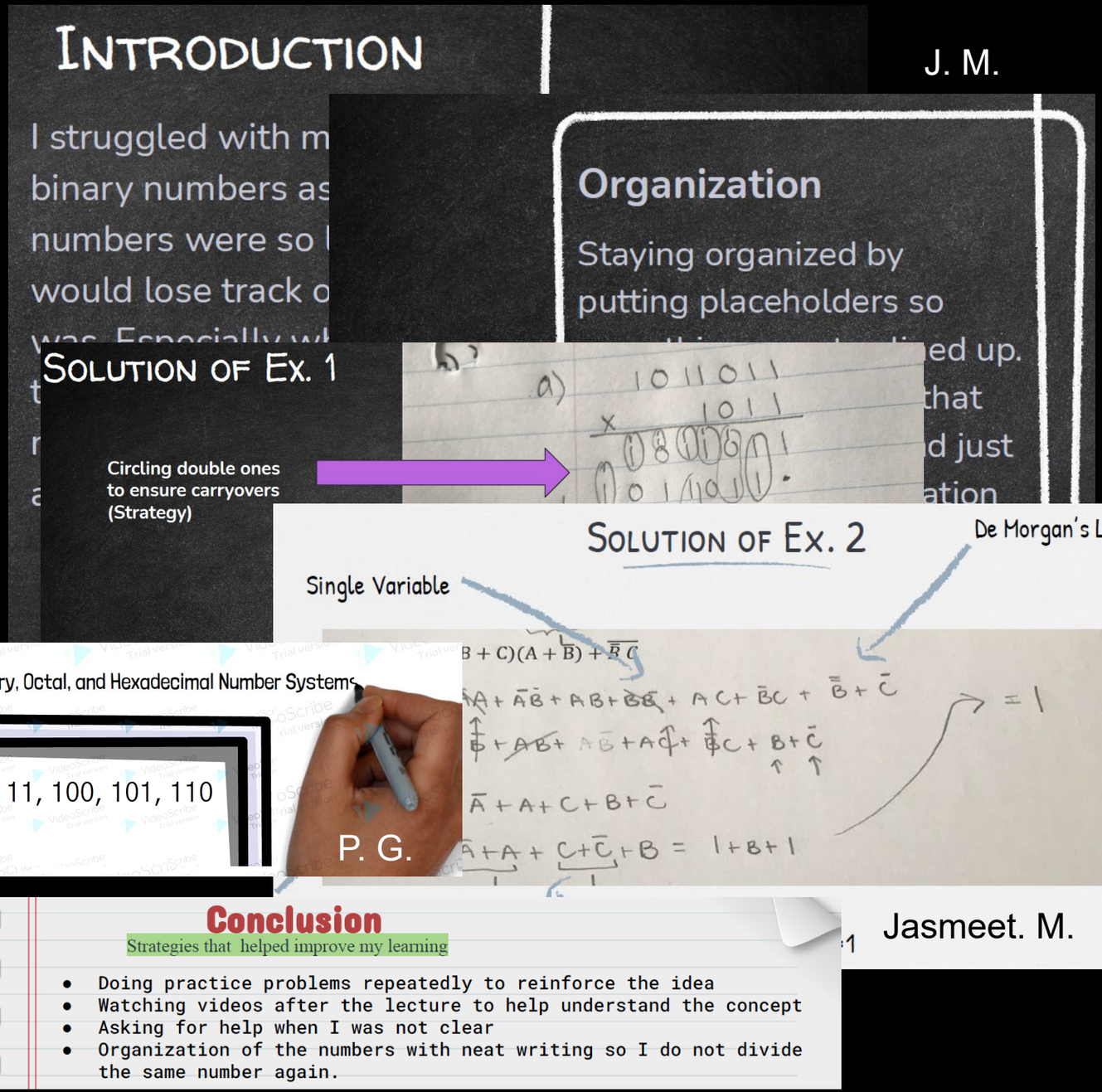




Participation

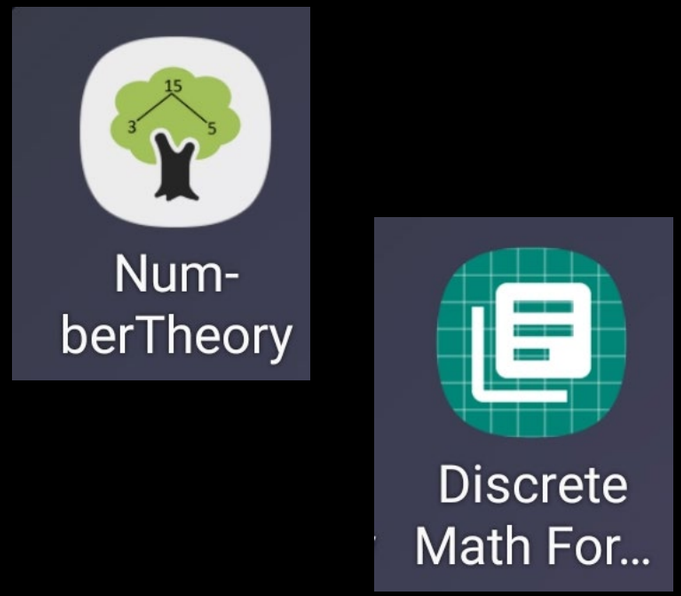
- Math Concept Encounter;

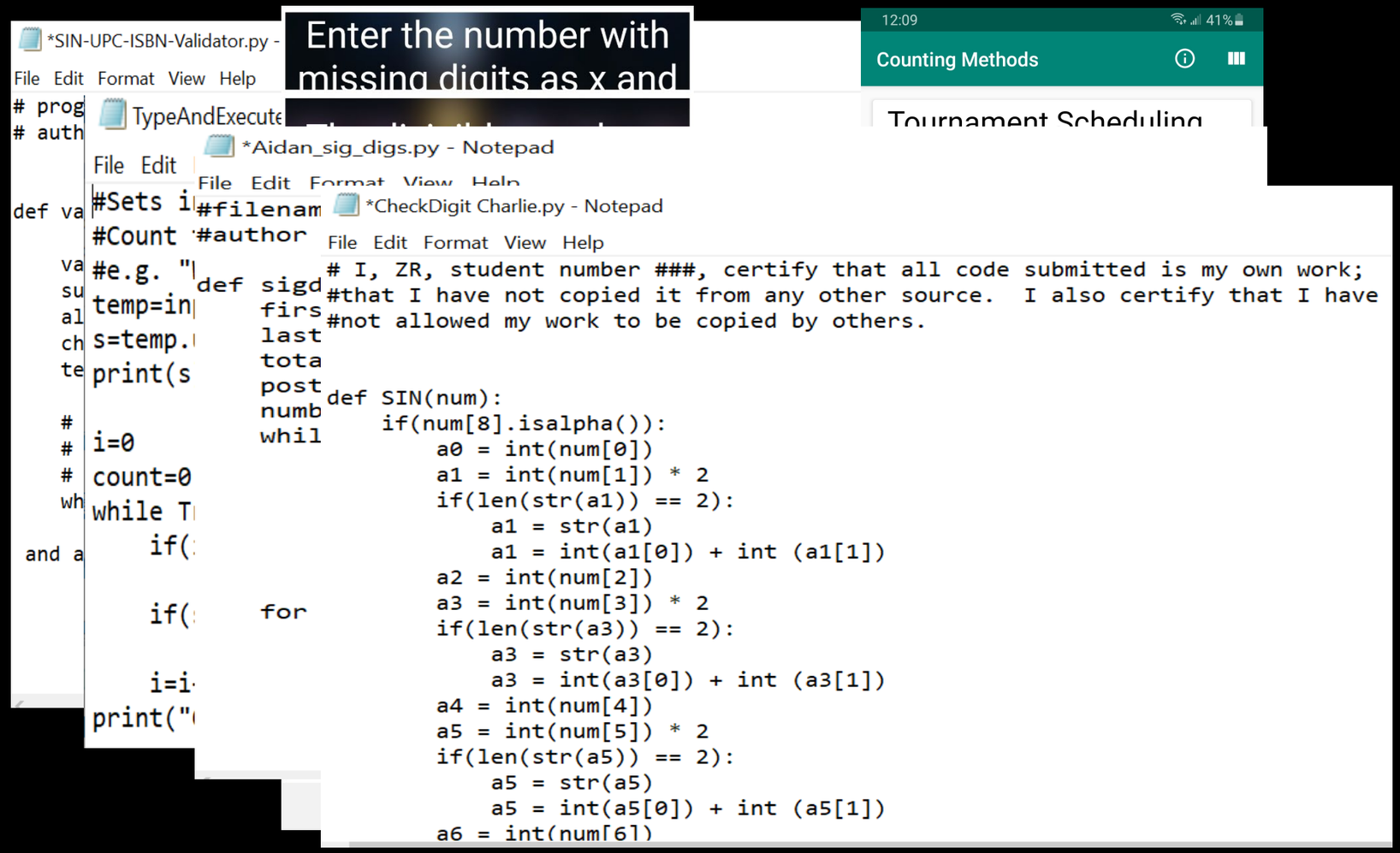
  - ✓ Pick a concept that you had problems understanding
  - ✓ Provide details on why this concept was challenging and how you came to understand the concept
  - ✓ Reflect and share what strategies helped improve your learning



Students’ work…

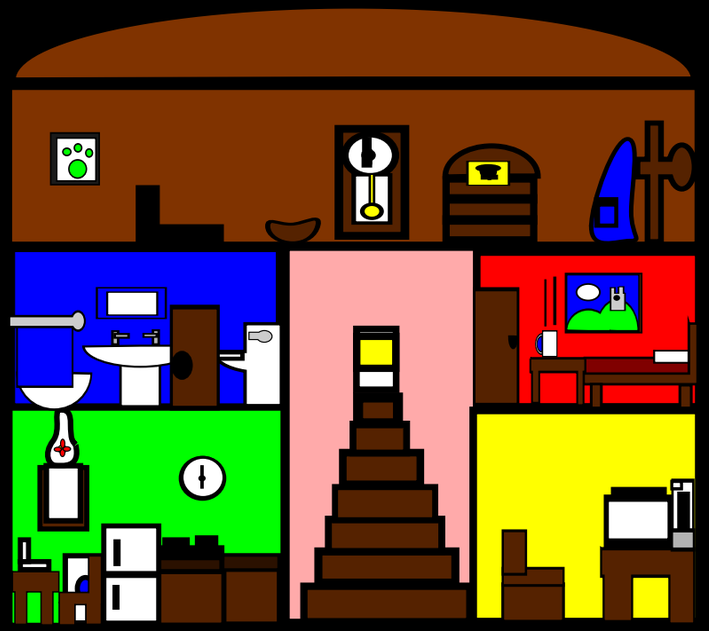
Students love sharing their accomplishments





Gamifying the Experience

- How gamification can increase student persistence and engagement?
  - ✓ motivated
  - ✓ awards and instant results
  - ✓ increased self confidence
  - ✓ encouraged not to be afraid to fail
  - ✓ establish team work skills
  - ✓ may guide students through the material



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Mat



MER ideas: Professor Paul McGrath, U of Waterloo

360 Images: Professor Richard Borger, Mohawk College

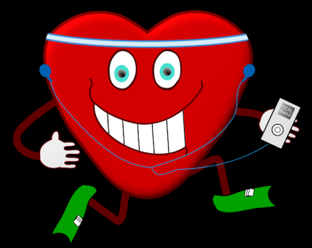
At the end…

- Our time is finite: focus on a few things at a time and then build upon every semester
- Surround yourself with colleagues that inspire you
- Add your own self care to any ToDo list

Ideas come in strangest ways…



I math, therefore I am!



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- What a year it has been, indeed!

What's next?

Questions & Inquires

Thank you!