

Complex Systems: Submitted by R. Larson, June 15, 2020

Teacher Notes 4. (Team Task 4, Teacher as Mentor and Guide): Final Essay and 10-Minute Lightning Talk.

Teacher: Here you are in the final phase of this Project-Based Learning exercise. You have great flexibility in outlining to the class how you would like their Team final reports and oral presentations structured. We leave it to you and your students on how – in your class – these team reports and oral presentations will be organized. Our preference is to provide general guidelines and then let each team come up with its preferred approach. During this week, as each team works on its final report with accompanying 10-minute Lightning Talk presentation, you are supporting guide and coach, but not lecturer!

It is often said, *“The best way to learn is to teach.”* As a teacher, of course you know that, as you experience it every day! Our key objective of this assignment is for the students to do just that – to teach their parents, grandparents, siblings, friends and general public about the complexities of Coronavirus and pandemic flu. Too often, high school STEM education focuses on teaching to a test, where students commit to memory various formulas and “algorithmic recipes,” to be parroted back on tests and then forgotten. Here, we have a more difficult assignment, insisting that the students get on top of complex material, organize it, decide upon their key points, and then write it cogently and succinctly. Also, they present their key ideas live in a Ten-Minute lightning round session. In this effort, you are a supportive coach and guide but not lecturer or decision maker. Students make their own decisions about what to include, how to structure their work and how to present it, both in writing and in person.

For Teacher to say to the class: You have already written short pieces on stocks and flows, the importance of R_0 and how we can reduce it. We’ve studied Herd Immunity. You have also studied feedback processes and feedback loops, including both vicious and virtuous cycles. You know about linearity and nonlinearity. Now let’s take a step back and explain what you have learned, and what you think your friends, family and community should do to overcome such pandemics. Individuals, families, businesses, policymakers, media, schools, neighbors, everyone, are all responsible to protect each other. What do you think they should do?

Pretend: You (as a Team) are invited by the editor of well-respected newspaper (such as *New York Times*, *Wall Street Journal*, or *Washington Post*) to coauthor an essay no longer than 700 words for the general public, and policymakers. Plus, once written, your team will present your essay’s key points live in a Ten-Minute “Lightning talk.” Regarding the essay, we suggest contacting local papers to see if they would be willing to accept a few student-driven Op-Ed pieces on the complex system of infectious diseases.

Since we have a number of teams in this class, it might be a good idea for different teams to have different topics to emphasize. I, the teacher, can help in the structuring of that, if you want. The readers don’t have much technical background; write in simple words, and to the point. And the Lightning Round will follow, at the conclusion to this Project-Based Learning exercise. To that, you can invite your parents and local community leaders. Now it’s time to start and Have Fun doing this!