

SPH4U - Final Project (10%)

Due: _____

Technology finds itself intertwined with science. As technology progresses, this impacts our scientific knowledge; and, as scientific understanding progresses, this often drives technological developments. In an effort to reduce costs and improve performance, it is common that when one is going to construct an experiment that it is modelled first using technology. At this point in the course we have experienced several simulations (e.g. Gizmos). This project asks you to compare a relationship between variables for a system you design using both a simulation and a physical activity or experiment.

Design/Simulation (5%)

	Level 4	Level 3	Level 2	Level 1
Design	Simulation/Experiment effectively focuses on one relationship that can effectively be isolated and explored. The design also draws from concepts from across the course.	Simulation/Experiment focuses on one relationship that can effectively be isolated and explored.	Simulation/Experiment has uncontrolled variables that affect the study of a single relationship.	Simulation/Experiment is unfocused.
Simulation	Builds own simulation using simulation software (e.g. Phision) to generate results for use in comparison with data gathered in physical lab	Effectively uses a pre-packaged simulation (e.g. PhET, Gizmo) to generate results for use in comparison with data gathered in physical lab	Uses a pre-packaged simulation to generate results for use in comparison with data gathered in physical lab	Simulation is used, but incongruent with physical lab.

Report (5%)**

1. *Briefly*, explain why you chose this relationship to study. Would your results be useful in a known application, or is this something new?
2. Write a *brief* description of the simulation and the physical design you used. Include a screen capture of the simulation (or video) and a picture of the physical set-up.
3. Compare your results from both methods (percent error calculation, graph, other?). If the values are different, *briefly* explain why this occurred. If the results are the same, *explain* how this was possible to achieve.
4. Reflect on your experience using a simulation in this project. Successes? Challenges? How would you improve your simulation/design if you were to repeat this study?

**Be sure to include references (as appropriate).