

# Epic Quest 2 Grading Rubric

Name \_\_\_\_\_

Objective	Score	Total
Is there a detailed description of the project and its intended goal?	5	
Is there an experimental background that describes what data will be collected and how it will be modelled? Is there a discussion of government policy and population density in different locations?	5	
Are there appropriately annotated data tables from at least two cited sources? Is there a discussion and analysis of the sources, the availability of the information provided and the uncertainty associated with each source?	5	
Does the data contain tables of: <ul style="list-style-type: none"> <li>• Death</li> <li>• Population</li> <li>• Positive Virus Tests</li> <li>• Total tests</li> <li>• Virus incubation, hospitalization, patient recovery, and/or data uncertainty</li> </ul>	10	
Are there plots of the above information vs. time for the duration of the pandemic?	5	
Are there mathematical models for the total infected, recovered, and susceptible and dead that incorporate differential equations.	5	
Is there a discussion of the above mathematical models that addresses assumptions about the spread of the virus, and quantifies residuals and uncertainty with reported data? Is there a discussion of why transmission rates change?	5	
Do the mathematical models offer future predictions until the “end” of the pandemic?	5	
Are there 2-D plots of mathematical models of the total infected, recovered, susceptible and dead? Are the 2-D plots of mathematical models superimposed with the data.	5	
Are the table of the parameter values, constraints, and expressions used in the mathematical models?	5	
Are there non-linear plots of infection trends that correlate to the parameters, constraints and expressions used in the mathematical models?	5	
Are there Monte Carlo Simulations that account for the uncertainty of your models	5	
Is there a calculation of the pandemic peak and conclusion date for each of the locations assigned?	5	
Is there a calculation of $R_0$ as a function of time for each locations	5	
Is there a conclusion that discusses the following items: <ul style="list-style-type: none"> <li>• The effects of government policy on viral transmission as expressed in your model’s quantifiable parameters.</li> <li>• The effects of population density, demography, and population mixing on viral transmission as expressed in your model’s quantifiable parameters.</li> <li>• The impact of a future vaccine on population susceptibility</li> <li>• The size of the inoculation needed for herd immunity</li> <li>• Data analysis, linear regression analysis, and uncertainty propagation that addresses the data used</li> <li>• A summary that addresses the project statement</li> </ul>	14	
Documentation honors all instructions, rules of spelling, and grammar.	3	
The project shows significant evidence of originality and inventiveness.	3	
Clear evidence that higher level thinking skills were used in the creation of this project.	3	
References and appendices are included	2	
Documentation exceeds expectations	5	