

Culminating Task: Making the World a Better Place

Part of the evaluation of this course will be in the form of a Culminating Task, worth **15%** of your final course work.

In this activity you will explore connections between the concepts learned in this course and environmental issues. Specifically, you will create a mathematical model and visual representations to provide evidence to convince investors that a way to improve an environmental issue of your choice would be a worthy project in which to invest.

Overview

You have decided that you are going to make a pitch to the hosts of a reality TV show where entrepreneurs request funding for projects, or products, designed to reduce the damage to the environment caused by human activity.

Your pitch must combine a compelling reason why your initiative should be supported, with evidence that justifies the need for action. You will research and collect secondary data, use the data to create graphical and algebraic models, make predictions based on your algebraic model and create a visual presentation using the media/ platform of your choice (PowerPoint, WordPress, Prezi, Weebly, iMovie, Show Me, Blogger, Tumblr, YouTube, etc.). The function used to create your algebraic model must be one of the types of functions (polynomial of degree 3 or higher, exponential, logarithmic or trigonometric) covered in this course.

Step 1:

Identify and describe an environmental issue and a proposed way to reduce impact and improve outcomes. The proposal could be as simple as a campaign to convince people to change daily habits that are harmful to the environment or as complex as developing a new environmentally friendly product or process.

Step 2:

Research secondary data from a reliable source and create a mathematical model to predict outcomes if no action to reduce harmful effects is taken.

Step 3:

Create algebraic and graphic representations of your model and provide a brief, but convincing, description of the benefits of your proposal.

Task Checklist

This assessment is out of **60 marks** and is worth 15% of your final mark. You will submit your Culminating Task upon completion of Unit 4 where you will be prompted at the end of the final learning activity to submit your assessment for feedback and a grade by selecting the “Assignments” link and following the submission directions.

Your proposal should contain the following elements:

Task Checklist Item	Weight (No. of marks)
A description of the environmental issue that needs to be addressed.	2
A description of the product or change in behaviour that could reduce the damage caused by the environmental issue, with justification.	5
A set of secondary data from a reliable source, in table form, pertaining to the environmental issue. It must be appropriate for modeling with one of the types of functions studied in this course: polynomial of degree 3 or higher; exponential; logarithmic or trigonometric. A spreadsheet (Excel, Google Sheets etc.) could be used to create the table and would facilitate graphing the data.	8
The APA reference for the data set.	2
A scatter plot of the data including appropriate titles, scales and units, created with the graphing technology of your choice.	5
An algebraic model that fits the data. The model can feature one of the functions mentioned above or could be a combination or composite of two of those functions. The choice of model should be based on visual inspection of data trends observed and does not need to be supported by statistical analysis, which is beyond the scope of this course.	5
An explanation of how the algebraic model was determined, including justification for the choice of parent function (or combined or composite function) and any transformations used to model the data.	5
restrictions on the domain of your function and a description, including justification, of potential limitations of the algebraic model as it applies to correlation with the data and the 'real world' context.	5
A graph of the algebraic model, including appropriate titles, scales, units, and restrictions on the domain, created with graphing technology, and superimposed on the scatter plot.	5
At least one calculation using the algebraic model to make a prediction, or for emphasis.	3
A brief sales pitch, using the graph as evidence, and calculations involving the algebraic model to make predictions to convince the reality TV show panel that your proposal deserves support.	10
Correct use of mathematical terminology and conventions throughout.	5

The teacher will assess your work using the following rubric. Before submitting your assessment, review the rubric to ensure that you are meeting the success criteria to the best of your ability.

Categories	Level 4 (80 – 100%)	Level 3 (70 - 79%)	Level 2 (60 – 69%)	Level 1 (50 – 59%)
Knowledge and Understanding	A data table is created with a high degree of effectiveness.	A data table is created with considerable effectiveness.	A data table is created with some effectiveness.	A data table is created with limited effectiveness.
	Graphing technology is used to create the required graphs with a high degree of effectiveness.	Graphing technology is used to create the required graphs with considerable effectiveness.	Graphing technology is used to create the required graphs with some effectiveness.	Graphing technology is used to create the required graphs with limited effectiveness.
	Calculations using the algebraic model are carried out with a high degree of effectiveness.	Calculations using the algebraic model are carried out with considerable effectiveness.	Calculations using the algebraic model are carried out with some effectiveness.	Calculations using the algebraic model are carried out with limited effectiveness.

Thinking	A clear link between the environmental issue, and the product or initiative being proposed to mitigate it, is established with a high degree of effectiveness.	A clear link between the environmental issue, and the product or initiative being proposed to mitigate it, is established with considerable effectiveness.	A clear link between the environmental issue, and the product or initiative being proposed to mitigate it, is established with some effectiveness.	A clear link between the environmental issue, and the product or initiative being proposed to mitigate it, is established with limited effectiveness.
	The algebraic model represents the data with a high degree of effectiveness.	The algebraic model represents the data with considerable effectiveness.	The algebraic model represents the data with some effectiveness.	The algebraic model represents the data with limited effectiveness.
	Restrictions on the domain and limitations of the model suit the context, and they take into consideration the correlation between the algebraic model and the data, with a high degree of effectiveness.	Restrictions on the domain and limitations of the model suit the context, and they take into consideration the correlation between the algebraic model and the data, with considerable effectiveness.	Restrictions on the domain and limitations of the model suit the context, and they take into consideration the correlation between the algebraic model and the data, with some effectiveness.	Restrictions on the domain and limitations of the model suit the context, and they take into consideration the correlation between the algebraic model and the data, with limited effectiveness.

Application	Appropriate secondary data is selected with a high degree of effectiveness.	Appropriate secondary data is selected with considerable effectiveness.	Appropriate secondary data is selected with some effectiveness.	Appropriate secondary data is selected with limited effectiveness.
	The process used to determine the algebraic model is described with a high degree of effectiveness.	The process used to determine the algebraic model is described with considerable effectiveness.	The process used to determine the algebraic model is described with some effectiveness.	The process used to determine the algebraic model is described with limited effectiveness.
	Transformations applied to the chosen parent function(s) are appropriate and are justified with a high degree of effectiveness.	Transformations applied to the chosen parent function(s) are appropriate and are justified with considerable effectiveness.	Transformations applied to the chosen parent function(s) are appropriate and are justified with some effectiveness.	Transformations applied to the chosen parent function(s) are appropriate and are justified with limited effectiveness.
	The algebraic model is used to support a point or make a prediction within the presentation with a high degree of effectiveness.	The algebraic model is used to support a point or make a prediction within the presentation with considerable effectiveness.	The algebraic model is used to support a point or make a prediction within the presentation with some effectiveness.	The algebraic model is used to support a point or make a prediction within the presentation with limited effectiveness.

Communication	Mathematical language and notation, throughout the activity, are used with a high degree of effectiveness.	Mathematical language and notation, throughout the activity, are used with considerable effectiveness.	Mathematical language and notation, throughout the activity, are used with some effectiveness.	Mathematical language and notation, throughout the activity, are used with limited effectiveness.
	The environmental issue is described with a high degree of effectiveness.	The environmental issue is described with considerable effectiveness.	The environmental issue is described with some effectiveness.	The environmental issue is described with limited effectiveness.
	The reference for the data set is stated in APA style with a high degree of effectiveness	The reference for the data set is stated in APA style with considerable effectiveness.	The reference for the data set is stated in APA style with some effectiveness	The reference for the data set is stated in APA style with limited effectiveness
	Elements of the activity that are pertinent to the presentation are synthesized to create a convincing bid for support with a high degree of effectiveness.	Elements of the activity that are pertinent to the presentation are synthesized to create a convincing presentation with considerable effectiveness.	Elements of the activity that are pertinent to the presentation are synthesized to create a convincing presentation with some effectiveness.	Elements of the activity that are pertinent to the presentation are synthesized to create a convincing presentation with limited effectiveness.

