**Subject area/course**: Mathematics; Algebra/Statistics

**Grade level/band**: 11-12

**Task source**: Marina MacDonald, Karen Anderson, Graeme Crowther, Suzanne Keifer, Matt Dubois, and Stephen McDonough (Laconia HS)

**What is Right for Me?**

**TEACHER'S GUIDE**

1. **Task overview**:

For this task, students will choose two colleges in different locations to analyze. Students will create and use trend lines and r2 values to analyze tuition and enrollment data from each college. They will use data from the past 5 years to fit functions to this data and make predictions for the time they will attend. Then students will interpret mean, median, range by analyzing information from the cities or towns where each college is located. This information will include statistics about population size, crime rates, careers, and income levels. The purpose of this assessment is to use statistics to think about and evaluate the different choices they have about where they might go after high school.

1. **Aligned standards:**
2. **Primary Common Core State Standards**

[CCSS.ELA-Literacy.W.11-12.4](http://www.corestandards.org/ELA-Literacy/W/11-12/4/) Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

[CCSS.ELA-Literacy.W.11-12.5](http://www.corestandards.org/ELA-Literacy/W/11-12/5/) Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

[CCSS.ELA-Literacy.W.11-12.6](http://www.corestandards.org/ELA-Literacy/W/11-12/6/) Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

[CCSS.Math.Practice.MP2](http://www.corestandards.org/Math/Practice/MP2) **Reason abstractly and quantitatively.**

[CCSS.Math.Content.HSS-ID.A.2](http://www.corestandards.org/Math/Content/HSS/ID/A/2) Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

[CCSS.Math.Content.HSS-ID.B.6](http://www.corestandards.org/Math/Content/HSS/ID/B/6) Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

1. **Secondary Common Core State Standards (optional)**

[CCSS.Math.Content.HSS-ID.A.3](http://www.corestandards.org/Math/Content/HSS/ID/A/3) Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

[CCSS.Math.Content.HSS-ID.A.4](http://www.corestandards.org/Math/Content/HSS/ID/A/4) Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

[CCSS.Math.Content.HSS-ID.B.5](http://www.corestandards.org/Math/Content/HSS/ID/B/5) Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

1. **Critical abilities**

Analysis of Information: Integrate and synthesize multiple sources of information (e.g., texts, experiments, simulations) presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to address a question, make informed decisions, understand a process, phenomenon, or concept, and solve problems while evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

Modeling, Design, and Problem Solving: Use quantitative reasoning to solve problems arising in everyday life, society, and the workplace, e.g., to plan a school event or analyze a problem in the community, to solve a design problem or to examine relationships among quantities of interest. Plan solution pathways, monitoring and evaluating progress and changing course if necessary, and find relevant external resources, such as experimental and modeling tools, to solve problems. Interpret and evaluate results in the context of the situation and improve the model or design as needed.

Communication in Many Forms: Use oral and written communication skills to learn, evaluate, and express ideas for a range of tasks, purposes, and audiences. Develop and strengthen writing as needed by planning, revising, editing, and rewriting while considering the audience.

1. **Other standards**

New Hampshire ELA 4: Explanatory Writing

New Hampshire Math 16S: Summarize, Represent and Interpret Data

New Hampshire Math 17S: Make inferences and Justify Conclusions

1. **Time/schedule requirements:**

This task will take approximately two weeks to complete.

1. **Materials/resources:**

* List of potential colleges
* Student access to the Internet and/or college catalogs for research
* Excel or other data analysis program (If this is not an option, drawing graphs by hand can be done as an alternative.)

1. **Prior knowledge:**

Students should be familiar with the following: data tables, mean, median, range, scatter plots, box plots, histograms, standard deviation, trend lines, r2 values.

1. **Connection to curriculum:**

None provided.

1. **Teacher instructions:**

Pre-Writing (1 day)

Before students begin their work, have them think about what they want to do in the future for college and for a career. Have students respond to the following prompts in a journal.

* + What academic interests do you currently have?
  + What career do you think you will pursue?
  + What colleges or universities have the necessary programs to pursue this career in the future (look into BOTH in and out-of-state)?
  + What other factors in a college or university are important to you? Why?
  + How does the location of the college affect your decision? How will location affect your college search?

Part 1: Tuition and Enrollment Analysis using Trend Lines and Extrapolation (5 Days)

* Students will need to access to the Internet to collect data on their chosen schools. It is also recommended that students use a program like Excel to organize and create graphs of the data. If this is not an option, drawing graphs by hand can be done as an alternative. Ensure that students extrapolate, or make a prediction based on their formula.
* Encourage students to spend some time looking at the college website and/or the college resource books to find OTHER interesting and important information about the colleges, for example, the student- to- teacher ratio or extra-curricular activities.
* Encourage students to write a couple of sentences that compare and contrast the enrollment and tuition for the two colleges.

Part 2: Location Analysis using Mean, Median and Range (1-2 Days)

* Students will need access to the Internet to collect data on their locations. For each statistic, students should write a brief explanation of what the numbers mean in the context of the task.

Part 3: Report on Options (5 days)

* As students write their reports, encourage them to check their work. Allow time for peer review and feedback. Below are suggested guidelines.
  + Use of Data: Did you clearly include the statistics you calculated in your writing?
  + Purpose/Organization: Did you outline your findings for the reader in a logical, sequential order? Was it easy to follow the information you presented?
  + Language: Was the essay written in a formal style, an objective tone, and with math terminology?
  + Conventions: Was the paper free from spelling, punctuation, capitalization, and grammar errors? Were proper sentence and paragraph structures used?
  + Sources: Cite ALL sources carefully and attach to your final analysis paper.

1. **Student support:**

Possible accommodations (discuss in advance with SPED and ELL teachers)

* All student directions can be provided in writing and read orally.
* If possible, research websites may be provided.
* Student directions and rubric may be modified to simplify language.
* Extended time and additional research supports and tools may be provided.

1. **Extensions or variations:**

This assignment may seem best suited for a student who “goes to college” in the traditional sense, but the teacher is encouraged to interpret the assignment in a way that allows for any variety of post-secondary decision (as long as it remains aligned to the standards).

1. **Scoring:**

Student work can be scored using the SCALE Math Performance Assessment Rubric (Grades 9-12).