Unit 4 Statistics and Kinematics

Content Area: **Science**
Course(s): **Prin of Enginee**
Time Period: **Semester 2**
Length: **1 week**
Status: **Published**

Standards

CS.9-12.8.1.12.DA.2	Describe the trade-offs in how and where data is organized and stored.
CS.9-12.8.1.12.DA.5	Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.
CS.9-12.8.1.12.DA.6	Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.
TEC.9-12.8.1.12	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.
TEC.9-12.8.2.12	All students will develop an understanding of the nature and impact of technology, engineering, technological design and the designed world as they relate to the individual, global society, and the environment.

Enduring Understandings

1. Engineers use statistics to make informed decisions based upon established principles.
2. Visual representations of data analyses allow for easy distribution and understanding of data.
3. Statistics is based upon both theoretical and experimental data analysis.

Essential Questions

1. Why is it crucial for designers and engineers to utilize statistics throughout the design process?
2. Why is process control a necessary statistical process for ensuring product success?
3. Why is theory-based data interpretation valuable in decision making?
4. Why is experiment-based data interpretation valuable in decision making?

Knowledge and Skills

It is expected that students will:

1. Calculate the theoretical probability that an event will occur.
2. Calculate the experimental frequency distribution of an event occurring.
3. Apply the Bernoulli process to events that only have two distinct possible outcomes.
4. Apply AND, OR, and NOT logic to probability.
5. Apply Bayes' theorem to calculate the probability of multiple events occurring.
6. Create a histogram to illustrate frequency distribution.

7. Calculate the central tendency of a data array, including mean, median, and mode.
8. Calculate data variation, including range, standard deviation, and variance.

Resources

Instructional Resources

4.1 CareerReflectionAbstractPresentation.docx
4.1.RU CareerReflectionAbstractPresentationRubric.docx
4.1.1.A StatisticalDataExploration.docx
4.1.1.A Probability.pptx
4.1.1.A Statistics.pptx
4.1.2.A CandyStatistics.docx

Assessments

https://docs.google.com/document/d/1wR7bQF-8AQoRrt0g4C3hKja0yjwDjC9_BiAmONWbTcI/edit?usp=sharing

Modifications

https://docs.google.com/document/d/1ODqaPP69YkcFiyG72fIT8XsUIe3K1VSG7nxuc4CpCec/edit