WAMC Lab Template

Math Concept(s): Statistics and Probability
Source / Text: Handout
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Date: Summer Conference 2016

Attach the following documents:

Lab Instructions:

1. Each individual member needs to have 2 dice
2. Roll one die 12 times and record the results in a table
3. Roll 2 dice 12 times and record the sum of dice in a table
4. Draw a histogram of the results for rolling 1 die and 2 dice
5. Get into groups of 5 and then create tables like steps 2 and 3
6. Draw a histogram of your group's results
7. Write your data on the table in the correct location
8. Record the results in your class data table that looks like steps 2 and 3.
9. Create Histograms of the class results

Student Handout(s)

Copies of the directions
Graph paper for the histograms

Rubric and/or Assessment Tool

Indicate "*SPECIFIC*" relationship to Science, Technology, or Engineering

This can be done using excel to collect the data and create the histogram.

Short Description (Be sure to include where in your instruction this lab takes place):

Lab Plan

Lab Title: Probability of dice

Prerequisite skills:
Probability, Data collection, attention to detail, understanding of histogram, understanding bell curve

Lab objective:
Apply concepts of probability to a given scenario

Standards:

Mathematics K–12 Learning Standards:

- Represent data with plots on the real number line (dot plots, histograms, and box plots).

- 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.
- Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.
- Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

Standards for Mathematical Practice:

- Reason abstractly and quantitatively.

K-12 Learning Standards-ELA (Reading, Writing, Speaking & Listening):

- Explaining through answering questions related to the activity

Leadership/21st Century Skills:

21st Century Interdisciplinary themes (Check those that apply to the above activity.)

☐ Global Awareness ☐ Financial/Economic/Business/Entrepreneurial Literacy ☐ Civic Literacy
☐ Health/Safety Literacy ☐ Environmental Literacy

21st Century Skills (Check those that students will demonstrate in the above activity.)

LEARNING AND INNOVATION
Creativity and Innovation
☐ Think Creatively
☐ Work Creatively with Others
☐ Implement Innovations
Critical Thinking and Problem Solving
☒ Reason Effectively
☐ Use Systems Thinking
☒ Make Judgments and Decisions
☒ Solve Problems
Communication and Collaboration
☒ Communicate Clearly
☐ Collaborate with Others

INFORMATION, MEDIA & TECHNOLOGY SKILLS
Information Literacy
☐ Access and Evaluate Information
☐ Use and manage Information
Media Literacy
☐ Analyze Media
☐ Create Media Products
Information, Communications and Technology (ICT Literacy)
☐ Apply Technology Effectively

LIFE & CAREER SKILLS
Flexibility and Adaptability
☐ Adapt to Change
☐ Be Flexible
Initiative and Self-Direction
☒ Manage Goals and Time
☒ Work Independently
☒ Be Self-Directed Learners
Social and Cross-Cultural
☒ Interact Effectively with Others
☐ Work Effectively in Diverse Teams

Productivity and Accountability
☐ Manage Projects
☒ Produce Results
Leadership and Responsibility
☐ Guide and Lead Others
☐ Be Responsible to Others

Teacher Preparation: (What materials and set-up are required for this lab?)

Materials

- Dice, graph paper (or computer)

Set-Up Required:

- none

Lab Organization Strategies:

Leadership (Connect to 21st Century Skills selected):

- Students will work individually at the beginning and then have to work in groups to complete this assignment

Cooperative Learning:

- Students will combine into groups and work together to collect data during the group portion of the activity.
- Students will contribute to the class portion of the assignment by adding their data to the class data at the front of the class

Expectations:

- Students will learn about probability, histograms and will identify patterns.
- Students will identify the difference between the results for the one die vs two dice histograms in the lab

Timeline:

- This should take one 55 minute period

Post Lab Follow-Up/Conclusions:

Discuss real world application of learning from lab

- Use of the bell curve

Career Applications

- Data analyst, product distribution

Optional or Extension Activities

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