

WAMC Lab Template

Math Concept(s): Reason Quantitatively And Solve Problems /Probability

Source / Text: Cord Algebra 1

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The following documents are attached:

Lab Instructions

Student Handout(s)

Data collection sheet, paper (graph?) to document results

Rubric and/or Assessment Tool

Formative through observations

Summative through exit slips

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

Students are placed into groups of 3. Each student takes a turn rolling first a single and then a pair of dice and enters their results on their handout(s). This is repeated 12 times until each student has had a chance to roll the dice 12 times. Students create a histogram (example on student handout) and then find their outcomes of probability. Compare their results with actual probability.

Lab Plan

Lab Title: A Roll of the Dice – A Game of Probability

Prerequisite skills: Graphing & data taking

Lab objective:

Summarize and interpret data collected while rolling dice a set number of times.

Standards:

S-ID-1

- Summarize, represent, and interpret data on a single count or measurement variable
Represent data with plots on the real number line (dot plots, histograms and box plots).

S-IC-1

- Making Inferences and Justifying Conclusions
Understand statistics as a process for making inferences about populations parameters based on a random sample from that population
- Understand and evaluate random processes underlying statistical experiments
- Use probability to evaluate outcomes of decisions

S-MD-5-A

- Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.
 - Find the expected payoff for a game of chance.

Standards for Mathematical Practice:

- Make sense of problems and persevere in solving them.
- Attend to precision

State Standards addressed (2008 Washington State Mathematics Standards):

A1.6.A Use and evaluate the accuracy of summary statistics to describe and compare data sets.

A1.6.B Make valid inferences and draw conclusions based on data.

A1.6.C Describe how linear transformations affect the center and spread of univariate data.

A1.6.D Find the equation of a linear function that best fits bivariate data that are linearly related, interpret the slope and y intercept of the line, and use the equation to make predictions.

Reading:

1. The student understands and uses different skills and strategies to read.
2. The student understands the meaning of what is read.
3. The student reads different materials for a variety of purposes.

Writing:

3. The student writes clearly and effectively.
4. The student analyzes and evaluates the effectiveness of written work.

Leadership/21st Century Skills:

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

- Global Awareness x 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

- x Reason Effectively
x Use Systems Thinking
X Make Judgments and Decisions
X Solve Problems

Communication and Collaboration

- x Communicate Clearly
x Collaborate with Others

INFORMATION, MEDIA & TECHNOLOGY SKILLS

Information Literacy

- x Access and Evaluate Information
x Use and manage Information

Media Literacy

- Analyze Media
 Create Media Products

Information, Communications and Technology (ICT Literacy)

- X Apply Technology Effectively

LIFE & CAREER SKILLS

Flexibility and Adaptability

- Adapt to Change
 Be Flexible

Initiative and Self-Direction

- Manage Goals and Time
x Work Independently
x Be Self-Directed Learners

Social and Cross-Cultural

- X Interact Effectively with Others
X Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
x Produce Results

Leadership and Responsibility

- Guide and Lead Others
x Be Responsible to Others

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

Materials

- Student handout
- a set of dice per group
- calculator

Set-Up Required:

- Typical classroom setup

Lab Organization Strategies:

Grouping/Leadership/Presentation Opportunities:

- Students working in groups provide opportunities for collaboration and natural leadership roles to emerge.

Cooperative Learning:

- Students must work cooperatively in order to produce effective results

Expectations:

- Students can figure out and discuss their estimated and actual statistics from the lab.
- Timeline: 50 minutes

Post Lab Follow-Up/conclusions:

Discuss real world application of learning from lab

- Make decisions based on high probability versus guessing

Career Applications

- Gaming industry, financial analyst, accounting

Optional or Extension Activities

- Provide additional 20-sided dice for further studies to students requiring extended learning opportunities.
- Determine probability of winning the lottery, hitting a slot machine jackpot etc.
- Provide additional opportunities to practice skills using other dice games i.e yatsee etc.

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