**WAMC Lab Template**

Math Concept(s): Linear Equations, Analyzing Data, Linear Regression, Line of Best Fit

Source / text: Glenco Algebra (1995) Chapter 3 and 5, CORD unit 16

Developed by: WAMC Team E-Mail: Date: Summer In-service 2013

**Attach the following documents:**

Lab Instructions

* Provide students with the direction sheet and a selection of rubber bands, dolls, tape measures, and tape. This is an open-ended lab with a variety of solutions

Student Handout(s)

* Barbie and Ken Go Bungee Jumping Direction Sheet – attached

Rubric and/or Assessment Tool

* Barbie and Ken Go Bungee Jumping Rubric – attached

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

Students explore linear relationships and data analysis through a lab where they predict the number of rubber bands needed to help “Barbie” get as close to the ground as possible, from a variety of heights, without bumping her head .

**Lab Plan**

Lab Title: Barbie and Ken Go Bungee Jumping

Prerequisite skills: Students will have had experienced how to label a graph, how to read a graph, and have cooperative learning experience. Students will have experience summarizing data, making predictions, and lab design.

Lab objective: Gather data about the number of rubber bands “Barbie and Ken” need to successfully bungee jump at a variety of heights. They will describe quantities graphically and then interpret the subsequent function(s) as evidenced by students predicting and describing results.

**Standards:**

CCSS-M: N-Q.1-3, F-IF.6

Standards for Mathematical Practice: MP.1, MP.2, MP.4, MP.5, MP.6, MP.7

State Standards addressed (2008 Washington State Mathematics Standards):

A1.2.D Determine whether approximations or exact values of real numbers are appropriate, depending on the context, and justify the selection.

A1.3.B Represent a function with a symbolic expression, as a graph, in a table, and using words, and make connections among these representations.

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

A1.8.A Analyze a problem situation and represent it mathematically.

A1.8.B Select and apply strategies to solve problems.

A1.8.C Evaluate a solution for reasonableness, verify its accuracy, and interpret the solution in the context of the original problem.

A1.8.D Generalize a solution strategy for a single problem to a class of related problems, and apply a strategy for a class of related problems to solve specific problems.

A1.8.E Read and interpret diagrams, graphs, and text containing the symbols, language, and conventions of mathematics.

A1.8.F Summarize mathematical ideas with precision and efficiency for a given audience and purpose.

A1.8.G Synthesize information to draw conclusions, and evaluate the arguments and conclusions of others.

Reading:

Writing: 3.3.1 Uses legible handwriting.

Communication: 2.2.1 Uses communication skills that demonstrate respect.

2.2.2 Applies skills and strategies to contribute responsibly in a group setting.

Science:

9-12 INQB Investigate – Collect, analyze, and display data using calculators, computers, or other technical devices when available.

9-12 INQC Explain – Draw conclusions supported by evidence from the investigation and consistent with established scientific knowledge.

9-12 APPB Work collaboratively with other students to generate ideas for solving a problem.

Leadership/21st Century Skills:

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| --- | --- | --- | --- |
| 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

* Rubber bands
* Dolls (Barbie, Ken, Barney, etc.)
* Yard sticks, meter sticks and/or tape measures
* Masking Tape
* Graph paper
* Writing paper
* Calculators
* Adding machine tape (optional)

Set-Up Required:

**Lab Organization Strategies:**

* See Barbie and Ken Go Bungee Jumping Direction Sheet

**Post Lab Follow-Up/conclusions:**

Discuss real world application of learning from lab

* Physics applications, materials science, materials fatigue, linear and non-linear equations which determine cause and effect

Career Applications

* Rock Climbing
* Crane operator
* Bungee Jumper
* Industrial Safety Officer

Optional or Extension Activities

* Run the experiment again with a variety of weights, a variety of rubber bands