BSI Activity Form

Name of Activity: *Barbie Bungee*
In this lesson, students model a bungee jump using a Barbie doll and rubber bands. The distance to which the doll will fall is directly proportional to the number of rubber bands ties to the doll, so this context is used to examine linear functions.

Class: Math 046 (Beginning Algebra)

Topic(s): Equations of Lines, Rate of Change, Slope, y-intercept, linear models, line of best fit.

Prerequisite Skills: Students should know how to find slope and write the equation of a line in slope-intercept form. Students should also have a good idea of physical interpretation of slope as a rate of change and what the y-intercept means

Materials Needed: Barbies, rubber bands (about 50 per group), measuring tapes

Time: 60-90 minutes (longer if equation of line of best fit is also found using technology)

Grouping Description: 3 students per group is ideal

Deliverables: (What will students produce?) **One report per group as described on student handout.**

Before the Activity:

Get students' interest by asking, "Do you think the length of the cord and the size of the person matters when bungee jumping? Allow students to offer suggestions as to what information would be important to conduct a safe bungee jump. You may also wish to search and show a short video about bungee jumping.

Activity Implementation:

Set up the lesson by telling students that they will be creating a bungee jump for a Barbie doll. Their objective is to give Barbie the greatest thrill while still ensuring that she is safe. This means that she should come as close as possible to the ground without hitting the floor.

Explain that students will conduct an experiment, collect data, and then use the data to predict the maximum number of rubber bands that should be used to give Barbie a safe jump from a height of 225 inches. At the end of the lesson, students will test their models by dropping Barbie from the walkway.

After all groups have completed the table, ask them to check their data. They should look for numerical irregularities. If any numbers in their table do not seem to fit, they may need to re-do the experiment for the number of rubber bands where the data appears abnormal.

> *Common student errors include not measuring to the lowest point of Barbie's fall. As students conduct the experiment the first time, circulate and attempt to spot errors as they occur. It will*

save time if students fix the errors during the initial experiment instead of having to re-do the experiment later.

Allow students time to answer the Analysis Questions in the packet, draw the scatterplot and the line of best fit. Circulate among groups and make sure that they are drawing one line through the scatterplot. Often students will join the dots with line segments. Some groups will easily find the equation of the line of best fit but some groups get stuck here.

You might decide to do some whole group instruction here if you see common errors.

Have groups check in with you to review their calculations before they go to the walkway.   Remind them to have at least one student downstairs to make sure that no one will be hit. The student that goes down can take pictures or videos to illustrate the distance between Barbie's head and the floor.

You may want to go out to watch the students' results.

Bring laptops to class so students can start typing their report if they finish early.

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