Floyd's of Fargo Student Worksheet

Your name: _____ Class Period _____
Partner's name if you have a partner: _____

Welcome to Data Games!

1) Watch the first short video introducing *Floyd's of Fargo*
   - If your teacher wants you to watch this video on your own computer, type in this URL:
     http://tinyurl.com/FloydsVidOne

2) Open the game
   - Type in this URL to open the *Floyd's of Fargo* game:
     http://tinyurl.com/floyds-datagame

3) Read the directions, and then click *Play*

4) Watch first
   - Click *Watch* for a few turns to see how many cars go by and how many flats occur, before you start setting a premium price or selling any insurance.
   - (Q1) How many cars passed by each time? _____
   - (Q2) Did the same number of flats occur each time? (yes/no) _____

5) Try selling at various premium prices
   - Your task in this game is to find the premium price that will earn your business the most money.
   - Enter a number in the Price per customer field by clicking the up and down arrows, or by typing in a value. Then click *Sell*.
   - If you get a message that says "There were no customers and no flat tires," your premium price was set too high.
   - There are 10 turns in each game. Play two or three full games, trying to sell at various prices. Also, click *Auto Finish* and see what happens.
   - (Q3) What is the highest ending balance you've earned in your games so far? _____

Your name: _____ Partner's name if any: _____

6) Watch the second short video
- If your teacher wants you to watch this video on your own computer, type in this URL:

http://tinyurl.com/FloydsVidTwo

7) Tip: Don't click *Clear Data* too much while playing
- There is only one level in *Floyd's of Fargo*, and it helps to have a good amount of data from which to draw conclusions.
- So don't *Clear Data* too much. You can highlight data in the graph from any game, as shown in the video, by selecting that game row in the table.

8) Play several more games, and then look at what's going on with your business.
- Look at your Table to answer the questions below. You might need to make a column or the whole Table wider by dragging their right borders to be able to see all the column headers and data.
- (Q4) How is the value for *revenue* being determined? Explain here.

- (Q5) How is the value for *payout* being determined? Explain here.

- (Q6) How is the value for *balance* being determined? Explain here.

- (Q7) If you play two games using the same premium price, do you always end up with the same balance? (yes/no) _____ (Try this using *Auto Finish* if you have not done so already.)
- (Q8) Why do you think this happens?

9) Collect more data
- Play at least several more full games, trying various premium prices.

Your name: _____ Partner's name if any: _____

10) Compare highest revenue with highest balance

- (Q9) Out of all of the games you've played, what is the highest revenue you've earned so far? _____
- (Q10) Which premium price earned that highest revenue? _____
- (Q11) Does it look like the same price that creates the highest revenue also creates the highest balance? (yes/no) _____
- (Q12) Why do you think this is?

11) Find the premium price that makes you the most money

- Create a graph with *lastPrice* and *endBalance* on the axes.
- Play more games using other premium prices until you're convinced you've found the highest end balance you can.
- (Q13) What do you think is the best premium price? _____
- (Q14) What is your end balance with that best premium price? _____

Extension Section: Develop an Explanation for Your Best Price

The rest of this worksheet will guide you in developing a mathematical explanation for your results.

12) Let's see how the number of customers is related to the premium price

- Click the *Graph* button to create a new graph, and then change the variables in the graph. (To do this, drag *price* from the Table to the *x*-axis of a graph and drag *customers* to the *y*-axis.)
- (Q15) How many customers do you get if you give the insurance away for free? _____
- (Q16) At what price will you no longer get any customers? (You may need to rescale the axes to see these points on the graph.) _____
- (Q17) Is the number of customers a function of the premium price? (yes/no) _____
- (Q18) If so, what type of function is it? _____
- See if you can now write an equation describing this function. One way is to choose **Show Movable Line** from the Gear menu in the upper-right corner of the Graph. Then drag that line to best fit the data, and look at the equation. You can also test your equation by going to the Gear menu and choosing **Plot Function**. Type in the equation you want, and it will be plotted on the graph.

Your name: _____ Partner's name if any: _____

- (Q19) The equation of the line that fits your data is: _____

13) Probability of getting a flat

- (Q20) Figure out the probability of any given customer getting a flat. _____
- Hint: To find this, you can try dividing some values in the Table. Or you can create a linear model of the relationship by creating a new graph with *totalCust* and *totalFlats* on the axes. Choose **Show Movable Line**, fit the line to the data, and look at the equation.
- (Q21) Write an equation relating the expected number of flats to the number of customers. _____
- (Q22) Use your Q19 and Q21 responses to write the equation for flats in terms of the price. _____

14) Give a convincing explanation that you've found the best premium price

- (Q23) Continue the process above, looking at revenue, payout, profit, and end balance. Create some equations, functions and/or graphs that offer a convincing mathematical explanation that you have found the best premium price.