Starburst Activity

(Adapted from a lesson by Doug Tyson)

**Overview:**

I like this activity for 2 reasons—it can be used with elementary/MS level classes to look at qualitative statistics. In addition, it provides opportunities for discussion of the ideas of mean, mode, median, range, along with opportunities for students to construct pie charts, bar charts, and other visual representations of statistical information. Secondly, it provides an opportunity (if you wish) to introduce the idea of quantitative statistics (more specifically, the concepts of linear regression and correlation). In that sense, it works well at HS levels, too.

**Materials Needed:**

A large bowl

A large quantity of starburst candies

A willingness to work with children who want to eat candy! ☺

The patience needed to spend the rest of the day working with children on a sugar rush!

Let’s break the lesson into 2 parts

Part 1—Qualitiative Statistics:

We’ll place the emphasis on the analysis of the starburst that each child is able to “grab” with one hand from the bowl. After each student takes a turn, and records his/her results, the candies are replaced in the bowl, and the next student takes a turn.

Each student is given the task of analyzing his “grab” by determining the amount of each color grabbed, along with the overall number of candies grabbed.

We’ll then create a “class set” of data, and students will be asked to analyze the entire class’ data set.

We’ll find mean, mode, median and range for each color. Students will generate pie charts/bar charts of their own data, along with the class data set.

You could also have students construct histograms and/or box and whisker plots for the class set of data.

Of course, students will determine that not everyone could grab the same number of candies—this might serve as a springboard to the 2nd possible application of this activity-that is, the look at quantitative statistics, and the use of linear regression as a predictive instrument.

Part 2—Quantitative Statistics:

The bridge to this activity is to have student suggest a factor that might be related to the amount of starbursts that one might grab from the bowl. I’d suggest entertaining a wide variety of such variables, maybe even some that wouldn’t make much sense (such as the number in a student’s family).

After settling on a possible EXPLANATORY VARIABLE (maybe—the width of a “grabber’s” hand, we’ll compile a table of x and y values for each student—x (hand width) and y (number of candies grabbed).

Now, we can generate a scatter plot, look at scatter, pattern, and head to a calculation of linear regression and correlation.

Of course, at the end, we’ll have to decide if the kids are going to eat the candy! Good luck saying no! ☺

I’ve included a worksheet, but you can surely adapt it to fit your class’ individual needs and abilities.

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Starburst Activity

Part 1

You have just been selected by the makers of Starburst to evaluate and gather data regarding the size of Starburst candies. To do this, your boss has asked you to develop a prediction model for the number of Starburst candies that a person can hold in one hand. The only problem: due to budget constraints, only one variable can be collected. Place your data in the table below.

1. Complete the following table by recording the number of Starburst held in one hand (for at least 3 seconds).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Trial #** | **Total Candies held** | **No. of**  **Strawberry** | **No. of Cherry** | **No. of Orange** | **No. of Lemon** |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |
| 6 |  |  |  |  |  |
| 7 |  |  |  |  |  |
| 8 |  |  |  |  |  |
| 9 |  |  |  |  |  |
| 10 |  |  |  |  |  |
| AVERAGE |  |  |  |  |  |

2. Complete your chart by finding the average of each column.

3. Now, give your average totals to your teacher, so that we can compile a class set of data.

4. Using your AVERAGE data amounts, construct a pie chart that shows the breakdown of candy types in your “average grab”.

5. Again, using your AVERAGE data amounts, construct a bar chart that shows the breakdown of candy types in your “average grab”.

6. Calculate the mean, median, mode (if it exists), and range for each candy type in your data set. Record your results in the chart below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Strawberry** | **Cherry** | **Orange** | **Lemon** |
| Mean |  |  |  |  |
| Median |  |  |  |  |
| Mode |  |  |  |  |
| Range |  |  |  |  |

7. Now, pick a color, and do a box and whisker plot for that color’s results during your 10 trials.

8. On this separate sheet of paper to be turned in tomorrow, write a paragraph that details your results for the Starburst Company. Be sure to include some of your mathematical results in the paragraph.

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Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Starburst Activity

Part 2

OH OH, it looks like some students have very different amounts of candy in a “grab”. Your boss challenges you to determine a variable that might be used to predict the number of Starburst candies that a person might be able to hold in a one hand grab. Due to budgetary constraints only 1 variable may be used, so it’s your job to decide on the BEST one for predicting the number of Starburst that a person can grab with 1 hand.

1. What might you propose to use as the EXPLANATORY VARIABLE in this procedure. The RESPONSE VARIABLE will be the total number of Starburst candies held in a grab. List at least 3 possibilities.

2. Now, let’s compile our class list of ideas. Which one seems to make the most sense? Why?

3. Now, we’ll do our data set again, this time we’ll just measure the 2 variables—EXPLANTORY AND RESPONSE.

4. Complete the following table.

|  |  |  |
| --- | --- | --- |
| **Trial #** | **EXPLANNATORY VARIABLE MEASURE** | **RESPONSE VARIABLE MEASURE (# OF STARBURSTS HELD)** |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |
| 9 |  |  |
| 10 |  |  |
| AVERAGE |  |  |

Calculate your average, and provide it to your teacher so that we can generate a class set of data.

5. On a separate sheet of graph paper, generate a scatter plot for your 10 trials.

6. Use available technology to calculate a linear regression model using your 10 trials as data points. Record your answer here.

7. Use available technology to calculate the regression coefficient, r, using your 10 trials as data points. Record your answer here.

8. How well does your data show a linear trend? If the trend isn’t linear, what trend might you observe?