**ACTIVITY 1:** Shake It Up with Scatterplots

**NAME:**

**ACTIVITY 2:** Histograms Manage a Flood of Data

**NAME:**

**ACTIVITY 3:** Tune In to Insurance

**NAME:**

**ACTIVITY 4:** Branching Out with Tree Diagrams

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**DATE:**

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A ctuaries use information about the magnitude and severity of earthquakes in a particular geographic area to help insurance companies determine how to serve their customers. The magnitude describes the size of the earthquake at the source. The table on the left below lists the number of recorded earthquakes in a particular region during a one-month period. The table on the right lists the average flood claims amounts as a result of storms in 2005. An average flood claim is the average of all the flood claims paid by the insurance companies.

**Questions:**

1. Complete the histograms using the information provided in the table.
2. What is the average of the data if you want to include wind speed in knots? Explain how you determined your answer.
3. What was the total amount paid out for the Tropical Storm Tammyn? Explain how you determined your answer.
4. What could be the cost to repair your property? Work with your group to find an estimate.

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**NAME:**

**DATE:**

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A ctuaries can use histograms to analyze the frequency of submitting insurance claims after a particular event. A histogram is a type of bar graph that shows the relative frequency of each category in a set of data. The bars are drawn adjacent to each other with no gaps between them. The height of each bar represents the frequency of the corresponding category. In this activity, you will create a histogram to display the number of earthquakes in a particular region during a one-month period.

**Questions:**

1. Plot the information given above as a scatterplot.
2. Use a ruler and mark the "line of best fit" for the scatterplot you have created.
3. What relationship do you notice based on the information plotted here? Is the relationship weak or strong?
4. Plot the information given above as a scatterplot.

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Y ou are the owner of Cyclone Secondhand Music and Movies, located in an area that has experienced a number of damaging tornadoes in the last ten years. Do you think it would cost more or less to insure customers in the Parkfield region against earthquake damage than it would customers in places where there are no recorded earthquakes? Why?

**Questions:**

1. List the possible outcomes that could happen if a hurricane has been identified.
2. What is the probability that this hurricane is a Category 1 after 16 hours? Write your answer as a fraction and a percentage.
3. What is the probability that this hurricane remains a Category 1 for the entire time? Write your answer as a fraction and a percentage.
4. What is the probability that this hurricane is to Category 2 after 16 hours? Write your answer as a fraction and a percentage.
5. After 16 hours, is it more likely that the hurricane will be a Category 1 or a Category 2? Explain your answer using fractions and a percentages.
6. If flooding is possible in any of these scenarios, would a storm and a flood be mutually exclusive events?