

## The Hand Squeeze

**Recommended grades level(s)** 9 -12

**Time Duration:** - 10 minutes

**Objective(s):**

The learner will be able to use data to create spreadsheets and histograms.

**Materials and/or Resources:**

Calculators

Data tables

Computer (optional)

**Background Information:**

**Procedures:**

1. Start with two students at the front of the room. (You're eventually going to need enough space for everyone in the class to get in a circle) Have the two students hold hands. When the timekeeper says "now" the first person should squeeze the hand of the second person who then squeezes the other hand of the first person. The last person will say "now" when she feels the hand squeeze come back to her. Record that data in the table below. Now add two more students to the circle and repeat the process, passing the hand squeeze around the circle. Record that time and repeat the process with two more students.
2. Continue the experiment, recording the time each time until everyone has joined the circle. Have everyone try to pass the squeeze as quickly as they feel it, maintaining the same rate of speed. If someone messes up, it's okay to disregard that time and repeat the experiment.
3. Organize the data into a table or in your calculator.
4. Create a graph either on paper or in your calculator. Make a graph of the data by plotting the above points, letting the x axis represent the number of students and the y axis represent the number of students and the y axis represent the number of seconds.

**Reproducible Materials:**

Analyze the Data

1. Should we connect the points to make a solid graph? Why or why not?
2. Are the points scattered all around the plane or do the points tend to be a certain shape?
3. Make a prediction: Based upon the data collected, how many seconds would it take to
4. Pass the hand squeeze around a circle of 100 people? How many minutes?

Extension:

1. Imagine students lined up from your city or town to Mexico City. How long would it take to pass the hand squeeze all the way there? You can find the distance by visiting the site.

Handout 1

Handout 2

**Development Resources:**

<http://math.rice.edu/~lanius/Algebra/hndsqa.html>

Number of students	Number of seconds
2	
4	
6	
8	
10	
12	
14	
16	
18	
20	
22	
24	
26	
28	
30	

Average time for impulse to travel in a circle = \_\_\_\_\_

Minimum \_\_\_\_\_

Maximum \_\_\_\_\_

Range \_\_\_\_\_

Median \_\_\_\_\_

Q<sub>1</sub> \_\_\_\_\_

Q<sub>3</sub> \_\_\_\_\_

## Post-It Histogram Activity

Materials list

Data from hand squeeze activity

Marker

Freezer or scotch tape

Post-Its

Paper that is approximately 50 inches long (such as fanfold computer paper)

Procedure:

1. Each group should write the individual times on a post-it (Large numbers)
2. Order the post-its in a single horizontal line from shortest to longest time
3. Record the minimum, maximum, and the range values. (Note: range = max – min)
  - a. What should you do if you have duplicated results?
4. Find and record the median (middle) by working from each endpoint simultaneously and eliminating pairs. *The data will be divided into two equal halves.*

Note: If there is an even number of data values take the average of the innermost two values.
5. Find and record  $Q_1$  (the first quartile) by working with the lower half of the data. Perform the same elimination procedure as you did for the median above.
6. Find and record  $Q_3$  (the third quartile) by working with the upper half of the data. Perform the same elimination procedure as you did for the median above.
7. Draw a horizontal (X) scale on the given paper. Make the width of each tick mark “one post-it note” wide. Each tick mark represents 1 second. Label the X scale with the appropriate name and units.
8. Using your X scale, place each post-it in the appropriate interval. Stack vertically any post-its that fall within the same interval.
  - a) What name and units would you use to label the vertical (Y) scale?

