

## Option 1

Needed materials: Digital kitchen scale and a bag of rice or dried beans.

Data collection steps:

- Place bowl on scale and set to zero.
- With a regular teaspoon, place one scoop of rice/beans in the bowl.
- Record point (1, weight).
- Add another scoop of rice/beans.
- Record point (2, weight).
- Continue for as many steps as possible (at least 10).

## Option 2

Needed materials: A digital scale for weighing people and a stack of clothes.

Data collection steps:

- Stand on scale.
- Record point (0, weight)
- Pick up one piece of clothing.
- Record point (1, weight + clothing item)
- Pick up another piece of clothing.
- Record point (2, weight + 2 clothing items)
- Repeat until your arms are full, at least 10 data points

## Option 3

Needed materials: A wire, cord, or cable that you can tie in tight knots and a measuring tape. It could be an old USB cable, an extension cord, an old phone cord, etc...

Data collection steps:

- Measure the length of the wire.
- Record (0, length).
- Tie one knot in the wire and measure the length.
- Record (1, length).
- Tie another knot in the wire and measure the length.
- Record (2, length).
- Repeat until the wire is full of knots (at least 10).

## Option 4

Needed materials: A breakfast cereal, preferably in round pieces (Froot Loops, Cheerios, etc...).

Data collection steps:

- Make a straight line with your cereal using 3 pieces. Then make a circle around those 3 pieces. Count the number of pieces (just the circumference) it takes to make the circle.
- Record (3, number).
- Now 4 pieces in a line. Make a circle around them. Count the number in the circumference of the circle.
- Record (4, number).
- Repeat! You can make as many circles as you want and as big as you want. Collect at least 10 data points.

## Option 5

Needed materials: Digital kitchen scale and a long piece of candy (like a Red Vine).

Data collection steps:

- Weigh the piece of candy.
- Record (0, weight)
- Take a *small* bite and weigh what is left.
- Record (1, weight)
- Take another *small* bite and weigh what is left.
- Record (2, weight).
- Continue at least 10 bites.

## Option 6

Needed materials: A digital stopwatch on your phone or on the web.

Data collection steps:

- Place finger above the start/stop button.
- Close your eyes.
- Press start and count 1 second.
- Press stop when you think exactly 1 second has passed.
- Record (1, actual time passed on stopwatch).
- Reset stopwatch.
- Repeat steps, but counting two seconds.
- Record (2, actual time passed on stopwatch).
- Repeat steps for at least 10 different times. Pick at least 5 times between 1 second and 10 seconds, but also use longer times like 20, 30, 60 seconds.

## Option 7

Needed materials: Pulse rate app for your phone (free and easy to find in the app store) and a willingness to do *a little* bit of exercise.

Data collection steps:

- Measure pulse rate when sitting and relaxed.
- Record (0, pulse rate).
- Exercise in some way for 10 seconds (jumping jacks, push-ups, brisk walking around your room or outside, etc...). Measure pulse rate.
- Record (10, pulse rate).
- Rest.
- Exercise in the same manner but for a longer period of time, say 30 seconds. Measure pulse rate.
- Record (30, pulse rate).
- Rest.
- Repeat until you have gathered 10 different measurements.
- You can do this over several days. And if you love to workout, you can modify this to match what you do. Feel free to be creative!

## Your StatCrunch Report

**\*\*Make a scatterplot**

→ Graph → scatterplot → choose your x & y variables → compute!

**\*\*Run regression**

→ Stat → Regression → Simple Linear → choose x & y variables → compute!

**\*\*Make residual plot (choose Residuals vs. X-values in Simple Linear)**

Save these **three** results for you report

(Options → Save → Screen 1; Options → Save → Screen 2 (residual plot))

## Your Report

**\*\*Describe a scatterplot**

**\*\*Interpret the correlation coefficient in context**

**\*\*Write the regression equation in context**

**\*\*Use the equation to make a prediction (you pick an x-value)**

**\*\*Find and interpret a residual in context (for a point that you choose, show your work)**

**\*\*Interpret the slope in context**

**\*\*Interpret the y-intercept in context **and** describe how your observed y-intercept does not match your prediction.**

**\*\*Use the residual plot to evaluate the effectiveness of the linear model**

**\*\*Interpret  $R^2$  in context**

**\*\*Discuss any outliers, high-leverage points, and influential points and their effect, if any, on the regression line and the correlation coefficient.**