Discovering the Central Limit Theorem

Prepare:

* One page per group. Identical pre-labeled x-axes for the entire class. 1-10, by 0.5. Use a ruler to create this. Split page in half vertically, “x” on the top half, “xbar” on the bottom half.
* Data entry spreadsheet in Google drive.

Split the class into groups (Expect n=26 total).

* Group 1: 3 students (n=2), Dx
* Group 2: 5 students (n=4), Dx
* Group 3: 9 students (n=8), Dx
* Group 4: 10 students (n=9), Dx

Setup

* Explain to students that they will be creating random samples to simulate a probability density distribution. Each roll is a data point.
* Each group assigns one person to be a *recorder,* another to be a *plotter.* Everyone else is a *roller*. The *plotter* is also a *roller.*
* Introduce the google sheet. The recorder is the only one that has a computer open.

Phase 1: Randomly sampling x’s

Rollers roll the dice and report the values to the recorder who enters the data into the Google sheet. The plotter draws a dot above the value on the x-axis on the top graph. Stack the dots for repeated rolls vertically. Collect as much data as you can in 5 minutes.

After phase 1, have groups describe the distribution of their data distributions.

Phase 2: Randomly sample x-bars.

Reassign two *rollers* to now be the *recorder* and *plotter*. All *rollers* in the group roll their die at the same time and report the value to the recorder, who enters the raw data points into the google sheet. The *recorder* then reports the calculated average to the *plotter*, who plots this data point as a dot on the bottom graph. Collect as much data as you can in 10 minutes.