

## Sampling Distributions with Pennies

Using a large collection of pennies:

- During the first week, have students select a single penny and record the year on a dotplot
- During the second week, have students select a sample of 5 pennies and record the average year ( $\bar{x}$ ) and the proportion of pennies from the 2000s ( $\hat{p}$ ) on separate dotplots.
- During the third week, have students select a sample of 20 pennies and record the average year ( $\bar{x}$ ) and the proportion of pennies from the 2000s ( $\hat{p}$ ) on separate dotplots.
- Make sure the original dotplot and the two  $\bar{x}$  dotplots are on the same scale. Likewise, make sure the two  $\hat{p}$  distributions are on the same scale.

I leave these on my wall for the rest of the year and refer to them often. One of the best features of the activity is using actual  $\bar{x}$  and  $\hat{p}$  symbols on the graphs. Then, my students don't have any problem understanding symbols like  $\mu$ -sub- $\bar{x}$  and  $\sigma$ -sub- $\hat{p}$ .

[From *Activity-based Statistics* originally. This post from Josh Tabor.]