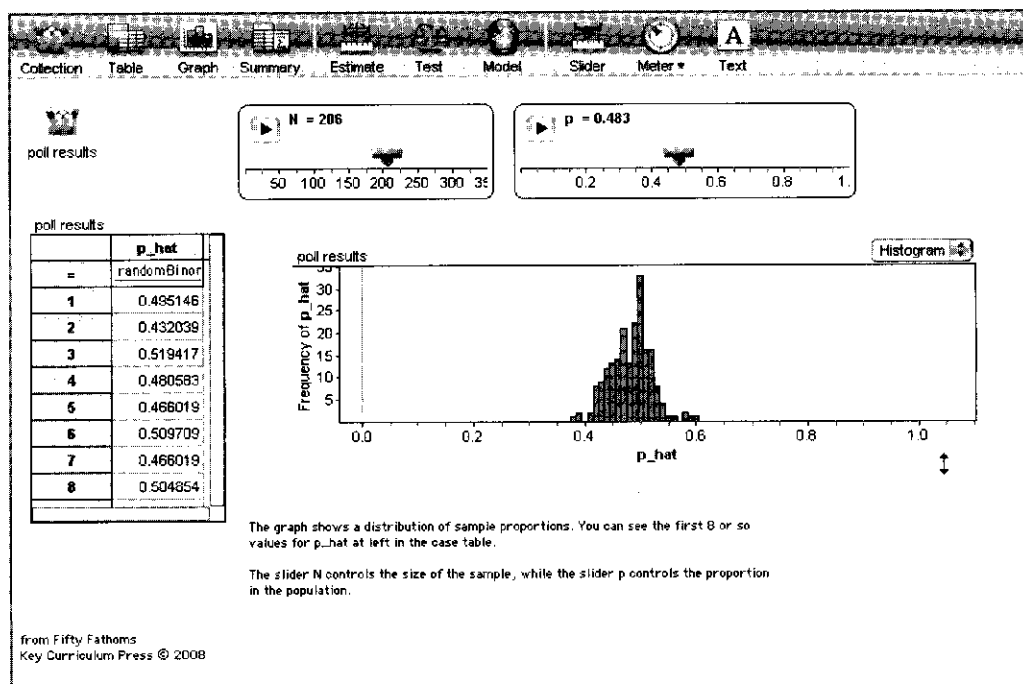# Demo 20: The Distribution of Sample Proportions

How sample size and population proportion affect the distribution

This simple demo lets you see quickly how the population proportion and the size of the sample affect the distribution of sample proportions.

What To Do

▷ Open **Dist of Sample Props.ftm**. It looks something like the illustration.

Suppose you're conducting polls about something where the respondents say simply yes or no. You control the number of people in each poll and the population proportion of "yes" by the sliders **N** and **p**, respectively. The graph of **p_hat** shows the distribution of sample proportions from 200 polls.

▷ Play with the sliders and see what happens. Answer the questions.

Note: Due to strange behavior on Fathom's part, avoid setting **p** to exactly **0.00**. If you do, the graph will go wacky. **Undo** does not help us here, but you can rechoose **Histogram** from the pop-up menu and rescale.

Questions

1 What's the main thing that happens as you move **p**?

2 What's the main thing that happens as you move **N**?

3 When is the distribution asymmetrical?

4 If you poll a sample of 100 people from a town, and in reality, 55% of the town wants new sewers, it is possible that less than half your sample will say they want new sewers. About how likely is that?
Sol

5 If you poll 50 people, and in reality 40% of a population says yes, what's the range of sample proportions you're likely to get?