1. The population proportion \( p \).

2. The sample proportion \( \hat{p} \).

3. Sampling error: \( p - \hat{p} \).

4. Our sampling model: simple random sampling.

5. The fundamental idea of statistical inference: \( \hat{p} \) is a random quantity that has a distribution.

6. The distribution of \( \hat{p} \):
   (a) Shape: binomial
   (b) Mean: \( p \)
   (c) Variance: \( \frac{pq}{n} \) Standard deviation: \( \sqrt{\frac{pq}{n}} \).
   (d) Caution: independence assumption not usually satisfied. Substitute the 10% Condition.

7. Useful approximation: \( \hat{p} \sim \text{Norm}(p, \sqrt{pq/n}) \).
   Condition: \( np \geq 10 \) and \( nq \geq 10 \).

8. Useful fact:: \( \sqrt{\frac{pq}{n}} \leq \frac{1}{2\sqrt{n}} \).

---

**Homework**

1. Read Chapter 18, pages 436–443. Read it more than once. Page 441 is the highlight.

2. Problems to turn in (Due Friday, March 19): 18.16, 18