

Suppose you are going to roll a fair six-sided die 60 times and record \hat{p} , the proportion of times that a 1 or a 2 is showing.

1. Where should the distribution of the 60 \hat{p} -values be centered? Justify your answer.
2. What is the standard deviation of the sampling distribution of \hat{p} , the proportion of all rolls of the die that show a 1 or a 2?
3. Describe the shape of the sampling distribution of \hat{p} . Justify your answer.

Power companies kill trees growing near their lines to avoid power failures due to falling limbs in storms. Applying a chemical to slow the growth of the trees is cheaper than trimming, but the chemical kills some of the trees. Suppose that one such chemical would kill 20% of sycamore trees. The power company tests the chemical on 250 sycamores. Consider these an SRS from the population of all sycamore trees.

4. What are the mean and standard deviation of the proportion of trees that are killed?
5. What is the probability that at least 60 trees (24% of the sample) are killed? (Remember to check that you can use the Normal approximation.)