

Lesson Summary

- The sampling distribution of the sample proportion is a graph of the sample proportions for many different samples.
- The mean of the sample proportions will be approximately equal to the value of the population proportion.
- As the sample size increases, the sampling variability decreases.

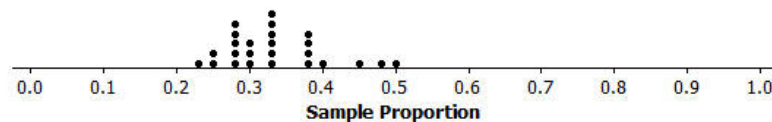
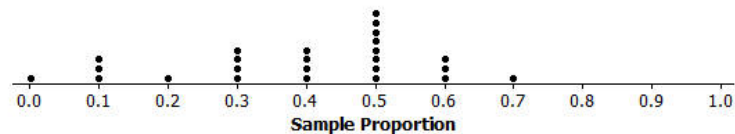
Problem Set

1. A class of seventh graders wanted to find the proportion of M&M's® that are red. Each seventh grader took a random sample of 20 M&M's® from a very large container of M&M's®. The following is the proportion of red M&M's each student found.

0.15	0	0.1	0.1	0.05	0.1	0.2	0.05	0.1
0.1	0.15	0.2	0	0.1	0.15	0.15	0.1	0.2
0.3	0.1	0.1	0.2	0.1	0.15	0.1	0.05	0.3

- Construct a dot plot of the sample proportions.
- Describe the shape of the distribution.
- Describe the variability of the distribution.
- Suppose the seventh-grade students had taken random samples of size 50. Describe how the sampling distribution would change from the one you constructed in part (a).

2. A group of seventh graders wanted to estimate the proportion of middle school students who suffer from allergies. The members of one group of seventh graders each took a random sample of 10 middle school students, and the members of another group of seventh graders each took a random sample of 40 middle school students. Below are two sampling distributions of the sample proportions of middle school students who said that they suffer from allergies. Which dot plot is based on random samples of size 40? How can you tell?

Dot Plot A:**Dot Plot of Sample Proportion****Dot Plot B:****Dot Plot of Sample Proportion**

3. The nurse in your school district would like to study the proportion of middle school students who usually get at least eight hours of sleep on school nights. Suppose each student in your class plans on taking a random sample of 20 middle school students from your district, and each calculates a sample proportion of students who said that they usually get at least eight hours of sleep on school nights.
- Do you expect everyone in your class to get the same value for their sample proportions? Explain.
 - Suppose each student in class increased the sample size from 20 to 40. Describe how you could reduce the sampling variability.