

Units 5 & 6 – Binomial, Geometric, and Sampling Distributions (3.5 Weeks)

Enduring Understandings

- Many discrete phenomena may be described and thus predicted by binomial and geometric models. [C2b, C2c]
- The normal distribution and central limit theorem are essential to analyzing samples of data. [C2b, C2c]

C2b: The course provides instruction in each of the following four broad conceptual themes outlined in the Course Description with appropriate emphasis on sampling and experimentation.

Essential Questions

- How can modeling predict the future?
- To what extent does our world exhibit binomial and geometric phenomena?
- How do sampling distributions relate to population distributions?
- What is a normal distribution?
- How does the normal distribution apply to the real world?

C2c: The course provides instruction in each of the following four broad conceptual themes outlined in the Course Description with appropriate emphasis on anticipating patterns.

Knowledge and Skills

- Recognize and apply the binomial distribution
- Find the mean and standard deviation of a binomial distribution
- Recognize and apply the geometric distribution
- Find the geometric mean
- Properties of the normal distribution
- The normal distribution as a model for measurements
- Sampling distribution of a sample proportion
- Sampling distribution of a sample mean
- Central Limit Theorem
- Sampling distribution of a difference between two sample proportions
- Sampling distribution of a difference between two sample means

Sample Assessments/Activities

- Students visit the [Rice Virtual Lab](#) to explore the Central Limit Theorem and sampling distributions. Students construct their understanding of how sample size and the shape of the population distribution affect the sampling distribution of the mean (and other statistics). [C2c, C5]
- Students complete a variety of released free response items focused on binomial, geometric, and sampling distributions.

C5: The course teaches students how to use graphing calculators and demonstrates the use of computers and/or computer output to enhance the development of statistical understanding through exploration and analysis of data, assessment of models, and simulations.