

# Discrete Mathematics

<b>NC Standard Course of Study: Discrete Mathematics</b>		
<b>GOAL 1: The learner will use matrices and graphs to model relationships and solve problems.</b>		2.02 Use theoretical and experimental probability to model and solve problems.
1.01	Use matrices to model and solve problems. a) Display and interpret data. b) Write and evaluate matrix expressions to solve problems.	a) Use addition and multiplication principles. b) Calculate and apply permutations and combinations. c) Create and use simulations for probability models. d) Find expected values and determine fairness. e) Identify and use discrete random variables to solve problems.
1.02	Use graph theory to model relationships and solve problems.	f) Apply the Binomial Theorem.
<b>GOAL 2: The learner will analyze data and apply probability concepts to solve problems.</b>		2.03 Model and solve problems involving fair outcomes:
2.01	Describe data to solve problems. a) Apply and compare methods of data collection. b) Apply statistical principles and methods in sample surveys. c) Determine measures of central tendency and spread. d) Recognize, define, and use the normal distribution curve. e) Interpret graphical displays of data. f) Compare distributions of data.	a) Apportionment. b) Election Theory. c) Voting Power. d) Fair Division.
		<b>GOAL 3: The learner will describe and use recursively-defined relationships to solve problems.</b>
		3.01 Use recursion to model and solve problems. a) Find the sum of a finite sequence. b) Find the sum of an infinite sequence. c) Determine whether a given series converges or diverges. d) Write explicit definitions using iterative processes, including finite differences and arithmetic and geometric formulas. e) Verify an explicit definition with inductive proof.
<b>Additional Content for Honors</b>		
2.03	Model and solve problems involving fair outcomes: e) Conduct in-depth investigations of municipal, state, and national elections as they occur. Include pre-election polls, election law, and voting patterns. f) Conduct in-depth investigations of legislative and congressional apportionment with respect to a recent census. Include legal and historic perspectives.	