**Virginia Mathematics Standards of Learning Tracking Log**

**Bridging from Discrete Mathematics**

The skills and strategies introduced in the Mathematics Standards of Learning vertically articulate from kindergarten to high school and many standards build in complexity within K-12 instruction. Teachers can use this tracker to help determine which standards students have had sufficient exposure and experience during the previous school year to make decisions regarding when and how experience with new standards might occur in the current school year.

| *The following standards outline the content of a one-year course in Discrete Mathematics. If a one-semester course is desired, the standards with a dagger (†) would apply.* | **Addressed during previous school year** | **Not Addressed/ Insufficient Exposure during previous school year** | **Comments** |
| --- | --- | --- | --- |
| DM.1† The student will model problems, using vertex-edge graphs. The concepts of valence, connectedness, paths, planarity, and directed graphs will be investigated. |  |  |  |
| DM.2† The student will solve problems through investigation and application of circuits, cycles, Euler paths, Euler circuits, Hamilton paths, and Hamilton circuits. Optimal solutions will be sought using existing algorithms and student-created algorithms. |  |  |  |
| DM.3† The student will apply graphs to conflict-resolution problems, such as map coloring, scheduling, matching, and optimization. |  |  |  |
| DM.4† The student will apply algorithms relating to trees, networks, and paths. Appropriate technology will be used to determine the number of possible solutions and generate solutions when a feasible number exists. |  |  |  |
| DM.6† The student will investigate and describe weighted voting and the results of various election methods. These may include approval and preference voting as well as plurality, majority, runoff, sequential runoff, Borda count, and Condorcet winners. |  |  |  |
| DM.7 The student will identify apportionment inconsistencies that apply to issues such as salary caps in sports and allocation of representatives to Congress. Historical and current methods will be compared.  |  |  |  |
| DM.8 The student will describe and apply sorting algorithms and coding algorithms used in sorting, processing, and communicating information.  |  |  |  |
| DM.9† The student will select, justify, and apply an appropriate technique to solve a logic problem. |  |  |  |
| DM.10 The student will use algorithms to schedule tasks in order to determine a minimum project time. The algorithms will include critical path analysis, the list-processing algorithm, and student-created algorithms. |  |  |  |
| DM.11 The student will solve linear programming problems. |  |  |  |
| DM.12a The student will use the recursive process and difference equations with the aid of appropriate technology to generate compound interest; |  |  |  |
| DM.12b The student will use the recursive process and difference equations with the aid of appropriate technology to generate sequences and series; |  |  |  |
| DM.12c The student will use the recursive process and difference equations with the aid of appropriate technology to generate fractals; |  |  |  |
| DM.12d The student will use the recursive process and difference equations with the aid of appropriate technology to generate population growth models; and |  |  |  |
| DM.12e The student will use the recursive process and difference equations with the aid of appropriate technology to generate the Fibonacci sequence. |  |  |  |
| DM.13a The student will apply the formulas of combinatorics in the areas of the Fundamental (Basic) Counting Principle; |  |  |  |
| DM.13b The student will apply the formulas of combinatorics in the areas of knapsack and bin-packing problems;  |  |  |  |
| DM.13c The student will apply the formulas of combinatorics in the areas of permutations and combinations; and |  |  |  |
| DM.13d The student will apply the formulas of combinatorics in the areas of the pigeonhole principle. |  |  |  |