

MATHEMATICS – DISCRETE MATHEMATICS

Subject: Discrete Mathematics
Academic Standard: DM.1
Academic Standard Indicator: DM.1.3
Core Standard: No

Standard Description (Academic or Indicator): Use combinatorial reasoning to solve problems.

Suggestion for Integrating International Content: Indian mathematics is credited with early interest in combinations. Research the Bhagabati Sutra, an Indian mathematical text dating about 300 BC, which provides a variety of formulas. *Example:* To calculate the number of groups that can be formed from the five senses.

Subject: Discrete Mathematics
Academic Standard: DM.2
Academic Standard Indicator: DM.2.5
Core Standard: No

Standard Description (Academic or Indicator): Use Markov chains to solve problems.

Suggestion for Integrating International Content: Have students research the life and work of Andrey Markov, a 19th-century Russian mathematician.

Subject: Discrete Mathematics
Academic Standard: DM.4
Academic Standard Indicator: DM.4.1
Core Standard: No

Standard Description (Academic or Indicator): Use graphs consisting of vertices and edges to model a problem situation.

Suggestion for Integrating International Content: Have students research the Konigsberg (located in present day Kaliningrad, Russia) Bridge problem as elucidated by German mathematician, Leonhard Euler, in 1735.

Subject: Discrete Mathematics
Academic Standard: DM.4
Academic Standard Indicator: DM.4.3
Core Standard: No

Standard Description (Academic or Indicator): Use graph coloring techniques to solve problems.

Suggestion for Integrating International Content: Have students determine how to color a map of the world using the minimum number of colors needed so that no adjacent states or countries are the same color. *Suggested resource:*
<http://serendip.brynmawr.edu/playground/fourcolor/> - scroll down until you see the applet for running the 4-color map problem on maps of your own creation.

Subject: Discrete Mathematics
Academic Standard: DM.7
Academic Standard Indicator: --
Core Standard: No

Standard Description (Academic or Indicator): Students use game theory.

Suggestion for Integrating International Content: Have students explore game theory using the ancient Hawaiian game of Konane. *Suggested resource:*
<http://www.cs.washington.edu/homes/mernst/pubs/konane-tr9524.pdf/>.
