Unit 07: Matrices

Content Area: **Mathematics**
Course(s): **Generic Course**
Time Period: **Semester 2**
Length: **2 weeks**
Status: **Published**

Standards - NJCCS/CCSS

MA.N-VM.C.7	Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.
MA.N-VM.C.8	Add, subtract, and multiply matrices of appropriate dimensions.
MA.N-VM.C.9	Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.
MA.N-VM.C.10	Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.
MA.A-REI.C.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
MA.A-REI.C.9	Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).
9-12.HS-ETS1-4.5.1	Use mathematical models and/or computer simulations to predict the effects of a design solution on systems and/or the interactions between systems.

Enduring Understandings

Matrices are a way to arrange numbers in the shape of a rectangle, rows and collums. We can use matrices to calculate systems and inverses.

Matrices can be used to solve a variety of word problems.

Essential Questions

How do you add, subtract, use scalar multiplication, and multiply matrices?

How do you find the inverse of a matrix?

In what way are matrices used to solve systems of equations?

What purpose can the calculator have in dealing with matrices?

What is a communication matrix and how do we use it?

Knowledge and Skills

- Find the sum, difference, or scalar multiples of matrices.
- Find the product of two matrices.
- Find the inverse of a 2 x 2 matrix and to solve linear systems using matrices.
- To solve communication network problems using matrices.

Transfer Goals

Recognize and solve practical or theoretical problems involving mathematics, including those for which the solution approach is not obvious, by using mathematical reasoning and strategic thinking.

Students will recognize that not all math was discovered thousands of years ago.

Resources

Precalculus: Graphical, Numerical, Algebraic 10th Edition

Desmos/Amplify

Problem-Attic

Deltamath

Geogebra