Unit 1 Reading (due Thursday, January 17)

Please let the instructor know immediately if you have trouble accessing any of these materials. There is nothing to turn in for your reading, but you will be expected to be comfortable with these concepts by your first quiz.

Required Reading:

Vector Spaces:

These short reads should just be a review from your linear algebra and/or geometry classes. They have some nice interactive visuals with which you can play around a bit.

- **Introduction to Vectors** (https://mathinsight.org/vector_introduction)
- **Dot Product** (https://mathinsight.org/dot_product)
- **Cross Product** (https://mathinsight.org/cross_product)
- **Vectors and Cartesian Coordinates** (https://mathinsight.org/vectors_cartesian_coordinates_2d_3d)

Affine Spaces and Barycentric Coordinates:

Affine Combinations, Barycentric Coordinates, and Convex Combinations (http://graphics.cs.ucdavis.edu/~joy/ecs175/Notes/CoordinateSystems/Affine-Barycentric-and-Convex.pdf) - A brief but thorough introduction to these topics.

Meshes and 3D Rendering:

These provide a brief first look at rasterization and the various ways that we can construct 3D scenes and render them to the screen.

Scratchapixel: It All Starts with a Computer and a Computer Screen (https://www.scratchapixel.com/lessons/3d-basic-rendering/rendering-3d-scene-overview/computer-discrete-raster)

Scratchapixel: And It Follows with a 3D Scene (https://www.scratchapixel.com/lessons/3d-basic-rendering/rendering-3d-scene-overview/rendering-3d-scene)

The following links are also useful with regards to Project 1, as they discuss how lists of numbers can be turned into vertices and--by extension--meshes.

Scratchapixel: Introduction to Polygon Meshes (https://www.scratchapixel.com/lessons/3d-basic-rendering/introduction-polygon-mesh) - You can skip the sections on Normals and Texture Coordinates, as we won't be worrying about those until a little later in the term.

Scratchapixel: File Formats to Store Polygon Meshes (https://www.scratchapixel.com/lessons/3d-basic-rendering/introduction-polygon-mesh/polygon-mesh-file-formats)