1046-05-84 **Gerald S Haynes***, Department of Mathematics, Central Michigan University, Mount Pleasant, MI 48859. *Vector Coloring.*

In the usual sense, vertex-coloring a graph consists of coloring each vertex so that if two vertices $u, v \in V$ are connected by an edge, then the color of v is different from the color of u. The minimum number of colors necessary for such a coloring is called the chromatic number of G, $\chi(G)$. We could also assign to each vertex a list of colors, and require that the color of the vertex be chosen from this list. We define G to be k-list colorable if for every assignment of lists of size k, we can find a valid coloring.

For this project, we introduce a non-discrete analogue called vector coloring. We define a valid vector coloring to be a coloring that assigns to each vertex a vector, where two vertices connected by an edge are assigned orthogonal vectors. If we assign to each vertex a subspace of some inner product space, and choose the vectors to be from these subspaces, we call this a subspace coloring. We define G to be k-subspace colorable if for any subspace assignments of dimension k, we can find a valid vector coloring for G. In 1979, Erdos completely characterized all graphs with list chromatic number 2. We explore these graphs to characterize all 2-subspace colorable graphs. (Received July 22, 2008)