The ability to diagonalize a matrix is nice for a number of reasons, but we cannot always diagonalize a matrix with a basis of eigenvectors. We propose a new concept, of diagonalizing a matrix using a spanning set (called a frame) instead of a basis. We discuss some peculiar properties of diagonalizing with a frame, and determine the minimum size of a frame that will diagonalize a given matrix. As this is a new concept, there are many basic unanswered questions that undergraduates with only a background in linear algebra can understand. We will discuss these and more in this interactive talk, so bring a pencil and an open mind!