As educators, we want to prepare our students to be able to solve complex problems in a changing world, in fields that perhaps do not even exist today. Toward this end, we see the importance of developing within our students the ability to ask deep questions and to approach these questions as researchers. Here we present the Matrix Project, an assignment that we have used in our Linear Algebra classes that is designed to develop both student curiosity and a research mindset that welcomes open-ended questions. (Received September 22, 2015)