We develop and analyze a new numerical method to approximate solutions of reaction diffusion systems defined on arbitrary surfaces. In particular, we are interested in reaction diffusion systems that model pattern formation on evolving surfaces. Such systems have numerous applications; examples include patterns on seashells and tropical fish, tumor growth and cell membrane deformation. The method we propose is based on radially projected finite elements and the power of this numerical method is that they are easy to implement, and all computations are done in logically rectangular coordinates. (Received January 25, 2012)