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Title: **Understanding 2 dimensional shapes**

Abstract: A 2 dimensional manifold is a 2 dimensional space that locally looks like a plane. In this project we will understand what such shapes can look like and obtain a classification of all compact 2 dimensional manifolds. This proof is entirely combinatorial and highlights the playful spirit of low dimensional topology. If time permits we will discuss connections to the geometry of such surfaces (the Gauss-Bonnet theorem which we may prove in the embedded surface setting) and the fact that non-orientable surfaces cannot be embedded in R^3.