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Ezra Miller* (ezra@math.umn.edu) and **Igor Pak** (pak@math.mit.edu). *Unfolding polyhedra.*

Most of us as children saw those paper or cardboard cutouts, which we could call “foldouts”, whose edges glue to form (boundaries of) 3-dimensional convex polyhedra. Just how did anyone figure out how to make them? Given a 3-dimensional convex polyhedron, does there always exist a foldout in the plane? What about higher dimensions? These questions have surprising answers, depending on the precise meaning of “foldout”. One method is to treat boundaries of polyhedra like Riemannian manifolds. Algorithmic concerns then raise fundamental issues of computational complexity for the combinatorics of geodesics on polyhedra. (Received August 29, 2006)