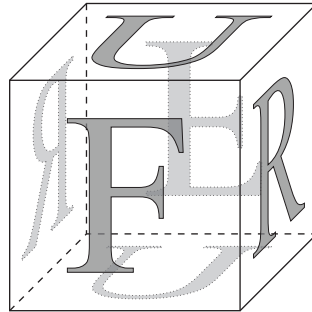
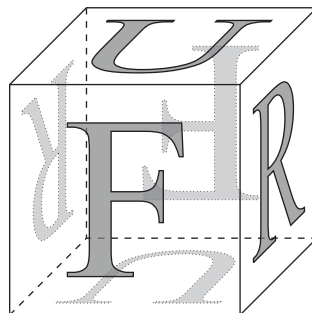


Additional Exercises for Chapter 4 of *Topology Now!*

1. Glue together the faces of a solid cube as shown in the figure below. Determine whether the result is a 3-manifold.



2. Glue together the faces of a solid cube as shown in the figure below.



- a. Show that the result is a 3-manifold.
- b. Determine whether the 3-manifold is orientable.
- c. Identify this as a 3-manifold that you know.
- d. The horizontal plane halfway between the top and bottom faces intersects the solid cube in a square. When the faces of the cube are glued together to form a 3-manifold, what surface is formed by this square? Determine whether this surface one-sided or two-sided.