



60 minutes



Grades  
3–5, 6–8

# Dome Home

Make a model of a geodesic dome.

## Instructions

By building a model of a geodesic dome, students recognize its structural efficiency and strength.

**1** Ask students if they've ever seen a geodesic dome. If they haven't, describe what it looks like. Ask them whether they think it would make a good place to live, compared to a typical rectangular house with a pitched roof. After taking some thoughts, say that they are going to see how strong and light a geodesic dome is by building a model of one.

**2** Pass out materials to each student and provide the following instructions:

- Tape the triangle pattern to a stiff piece of paper or folder and cut out all 15 triangles.
- Tape 5 triangles together in the pattern shown in Figure 1.
- Tape edges A and B together to form the dome roof.
- Tape 10 triangles together in the pattern shown in Figure 2.
- Tape end C to D to form the wall of the dome.
- Tape the roof on top of the wall.
- See how much weight your dome can hold. Try pressing down gently with your hand, then add a book, and continue to add more weight until it shows signs of breaking.

## Materials

PER STUDENT:

- A sheet of stiff paper or a file folder
- Clear adhesive tape or masking tape
- Triangle pattern template, Figures 1 and 2



## Engineering & Science Connections

-  A geodesic dome is a sphere-like frame structure that is made up of triangles. The triangles create a framework that is structurally very strong. The design also provides great interior space because it doesn't need columns or other interior supports. Geodesic domes are the strongest, lightest, and most efficient buildings yet devised.

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-  A college professor named Buckminster Fuller designed the first geodesic dome in 1951. He became famous for his work in this area. The geodesic dome has many advantages over flat-sided structures: no internal support columns are needed and it encloses the greatest amount of space with the least amount of material.

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-  In many underdeveloped parts of the world, geodesic dome homes are made from corrugated metal. They provide shelters that are easy to assemble and can be built for minimal costs. Geodesic dome structures are also used for mobile military housing.

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-  The structural members between two points in a geodesic dome are called struts. These struts are either in compression or tension when a load is applied to the dome. There are no bending stresses in the struts. This is very similar to a truss, which also uses triangles to form its structure.

## Guiding Questions ?

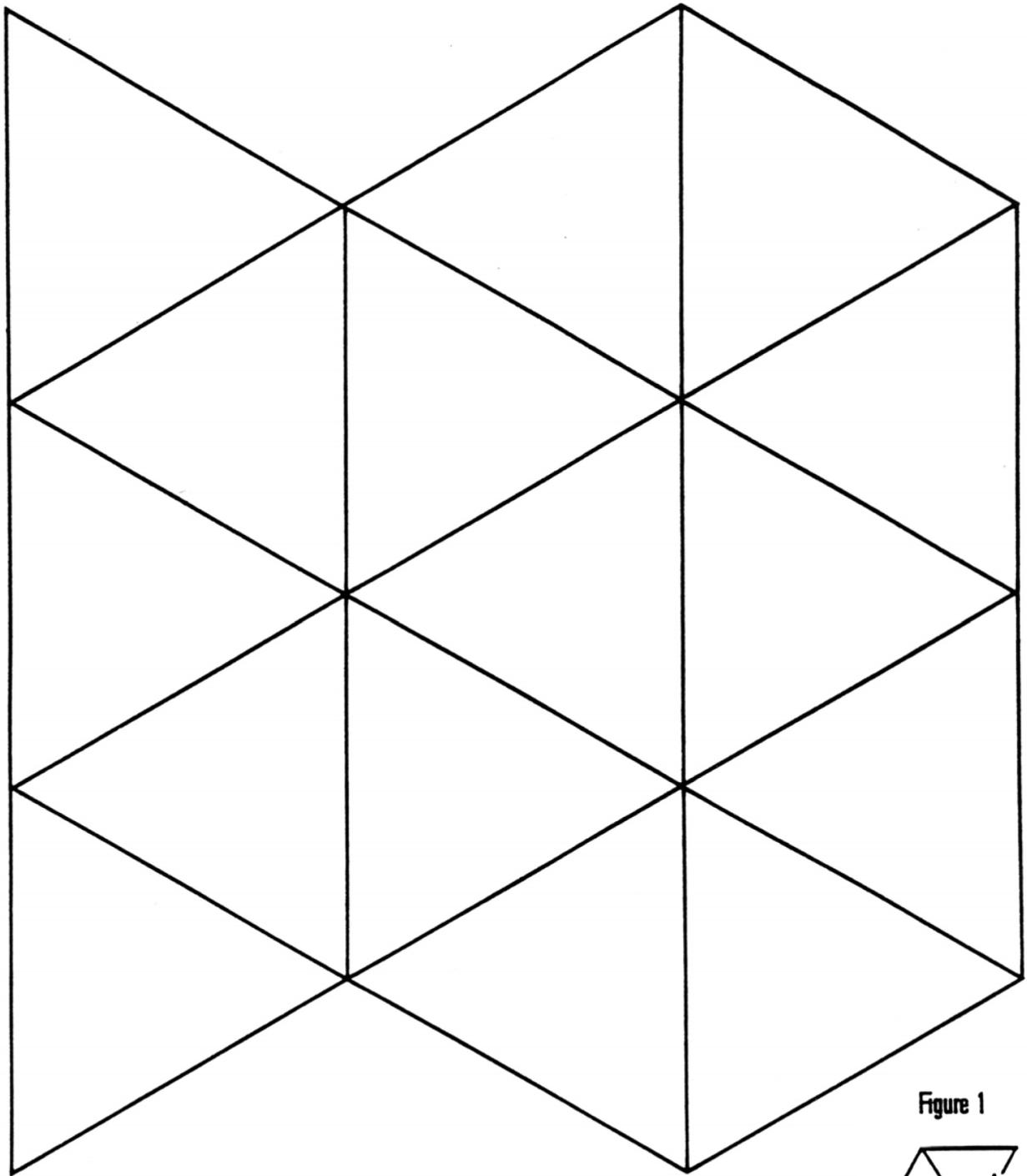
Where would you put windows and doors?

If you wanted to connect 2 domes, how would you do it?

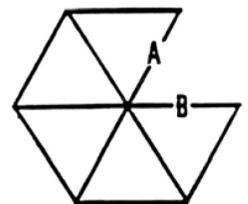
What sort of building material would you use to build an actual geodesic dome home?

Why do you think geodesic domes are not more commonly used?

*Activity provided by Needham Science Center.*



**Figure 1**



1. Tape the triangle pattern to a stiff piece of paper and cut out all 15 triangles.
2. Tape 5 triangles together in this pattern. (Figure 1)
3. Tape edges "A" and "B" together to form the dome roof.
4. Tape 10 triangles together in this pattern. (Figure 2)
5. Tape end "C" to "D" to form the wall of the dome.
6. Tape the roof on top of the wall then press down to test the strength.

**Figure 2**

