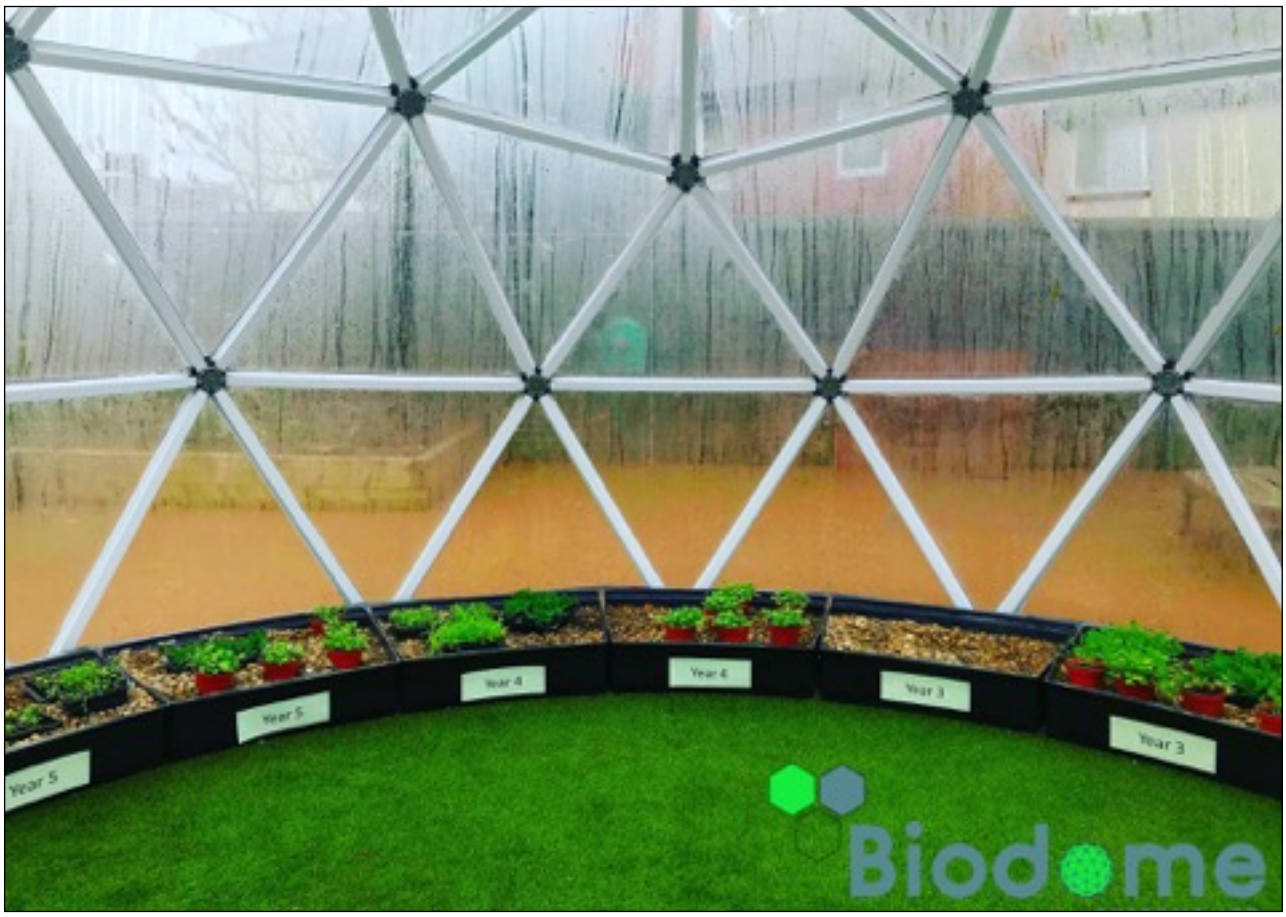
Build Your Own BioDome

Scale Model Activity Pack

Jamie Clarke - 6 October 2020



Introduction

Geodesic domes are elegant and sophisticated structures. Lightweight and strong, they make very efficient use of materials. They are an ideal structure for use in remote areas like the Arctic. Some day we may even see dome structures on the moon or covering cities.

This site will take you, step by step, through the process of constructing a geodesic dome from paper. Information is also included for designing domes of different sizes.

This project can be related to topics in design and technology and components of the science and curriculum. Geodesic domes demonstrate tension and compression in a unique structure.

You can construct a geodesic dome out of a variety of materials, this dome is constructed of paper. Use the design concepts outlined here to construct domes of different sizes. Try materials like Bristol board, corrugated cardboard, plywood even ice!

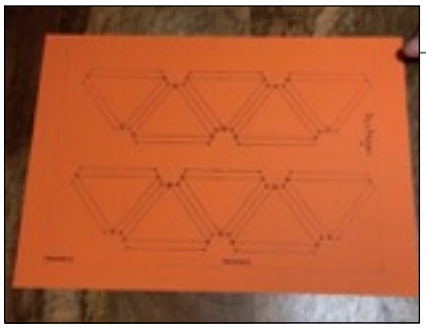
For students in year 5 or year 6 some teachers have combined this activity with art class, turning the domes into vibrant, colourful sculptures. For more advanced students you can begin to explore the math that goes into creating these shapes and even drawing such triangles with compass and ruler.

Background

Geodesic domes, popularized by Buckminister Fuller, incorporate the structural integrity of triangles into the inherent strength of a dome or shell structure.

What You will Need

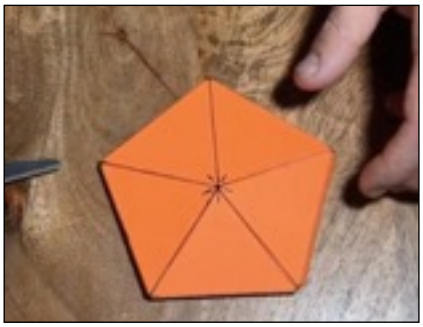
For this activity you will need 3 A4 pages of thin card templates titled pentagon and 1 A4 page of thin card template marked triangle. You will also need glue stick and scissors. You can optionally follow this link for an instructional build video:



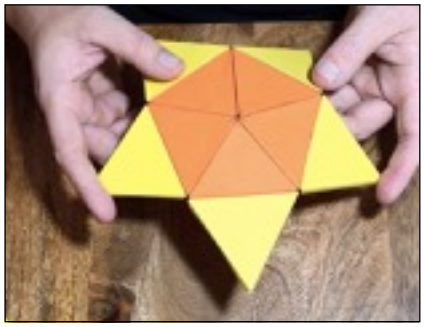


Step 1:
Download the templates and print them on thin card stock
Step 2:
Cut out all the triangles
Step 3:
Fold the tabs of all the triangles neatly





Step 4: Take 5 of the triangles from the page marked pentagon and glue them together, make sure all the arrows are pointing towards the centre of the pentagon.


Step 5: Glue together all of the pentagons, you will need 6 pentagons

Step 6: Glue 5 yellow triangles around the pentagon

Step 7: Glue 5 orange pentagons into the gaps left by the yellow triangles

Step 8: Fill the 5 remaining gaps with yellow triangles

How Strong is it?

How much does the model weigh and how much weight can it support? Did the results surprise you? Why or why not? What was the hardest part about creating the dome?

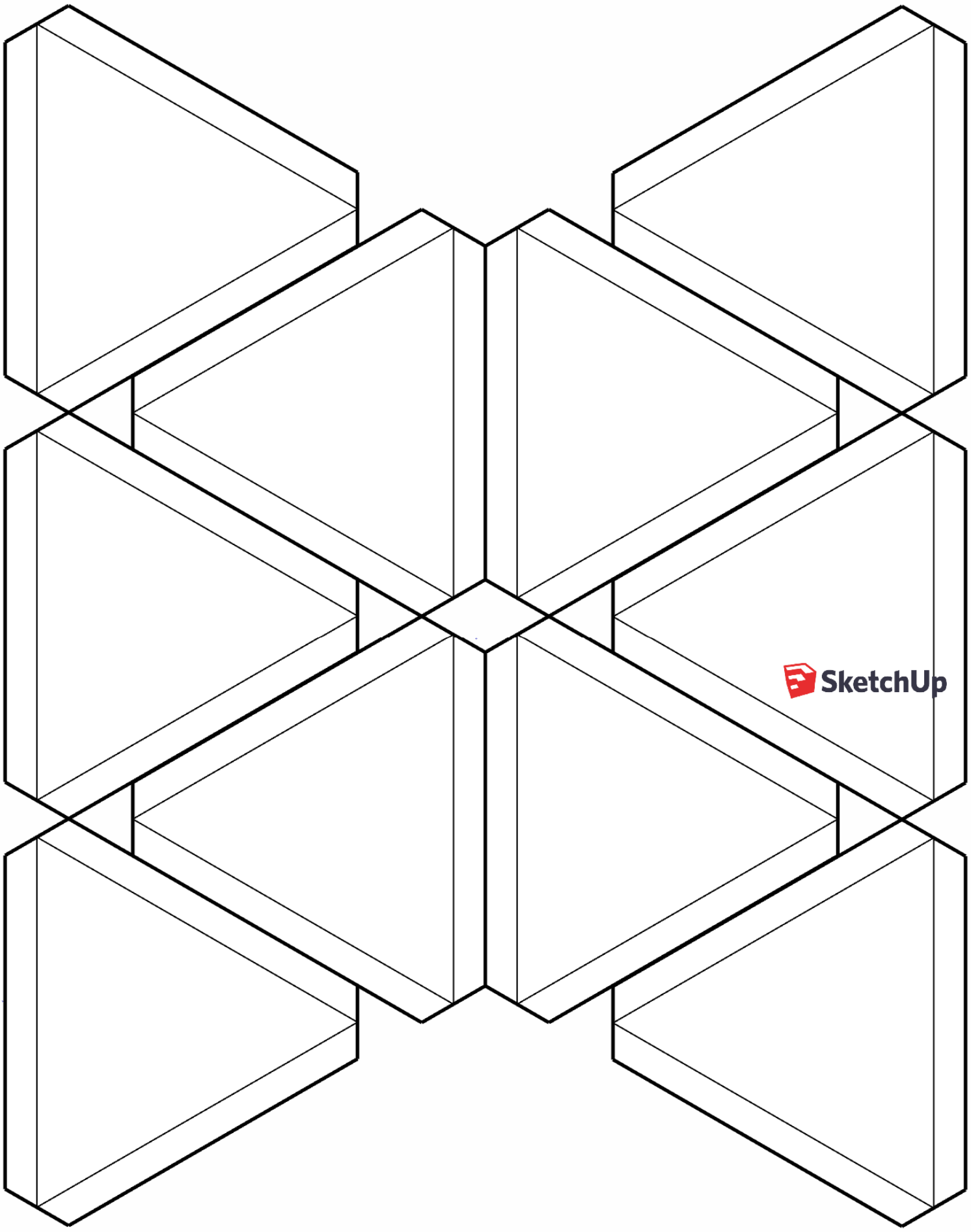
Build on It!

How could you make your dome stronger without interrupting the space underneath it? Make a prediction and test it.

Think about it!

What other structures in the world can you think of that use triangles in their construction?

Triangles



SketchUp

Pentagons

