GEODESIC DOME BUILD INSTRUCTIONS

v3 2026

Designed as a team-building session for Year 1 BA Primary Education students at the University of Brighton, these instructions show how to prepare and build a large cardboard geodesic dome. Read on for materials, measurements and motivation!

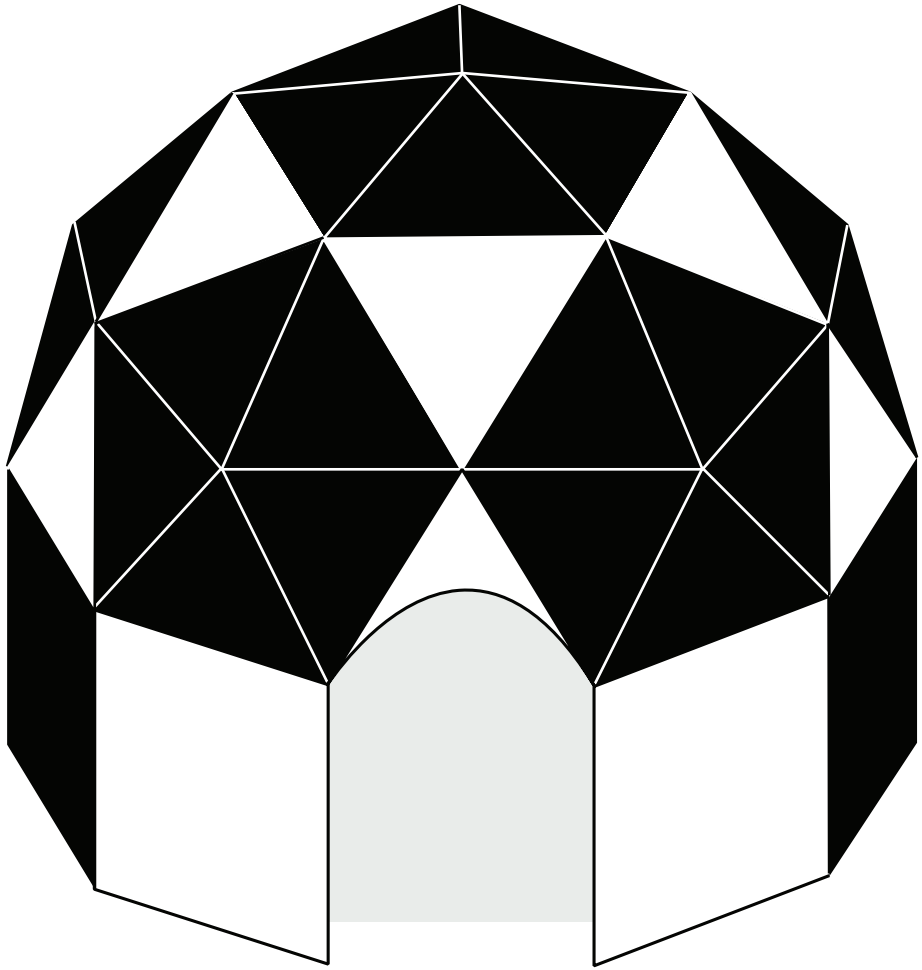
CONTENTS:

REQUIRED:

PREPARE
- DOUBLE WALL CARDBOARD SHEETS
- CUTTING MAT
- STANLEY KNIFE
- METRE RULER (METAL BEST)
- PENCIL

DECORATE
- STENCILS
- STENCIL SPONGES
- READY-MIX PAINT

BUILD
- GUMMED TAPE
- SCISSORS
- SPONGES
- ICE-CREAM CONTAINER OR SIMILAR FOR WATER

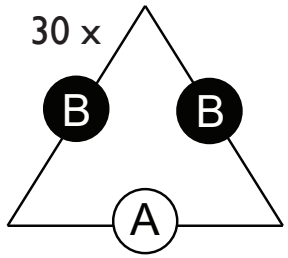


BUILD YOUR OWN DOME *ANY SIZE!*

CREATE:
- A PLAY SPACE
- A PLANETARIUM
- AN OBSERVATORY
- AN ART GALLERY
- AN EVENT SHELTER
- A GARDEN TENT/SHADE
- A PET HOUSE

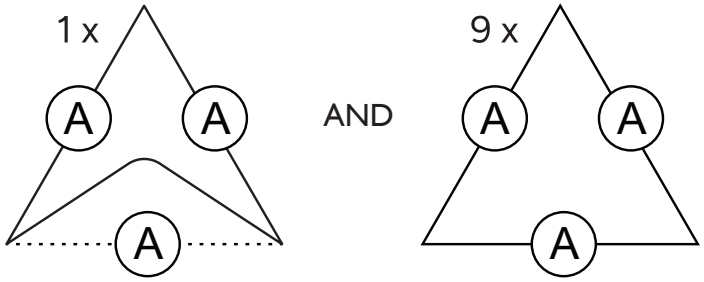
DOME PANELS REQUIRED

You will need the following 49 panels (50 if a door is included).
To determine the sizes required for your specific dome, please see the next page.



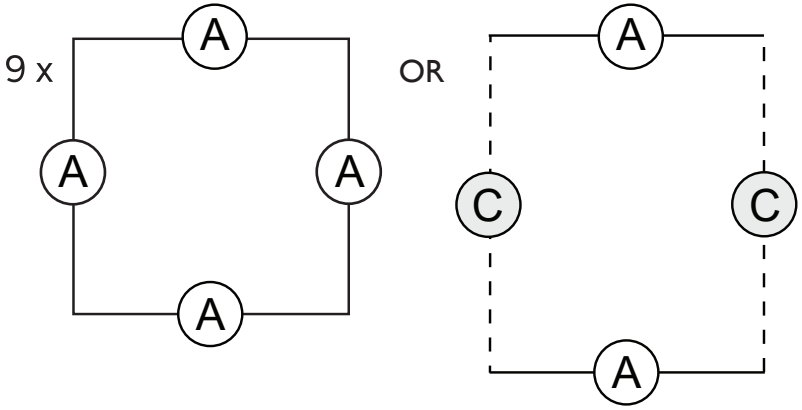
30 isosceles triangles (ABB)

They are shorter than the equilateral triangles.



10 equilateral triangles (AAA)

Cut one of the AAA panels as shown to create an arch for the doorway.
They are taller than the isosceles triangles.



9 squares (AAAA) or rectangles (ACAC)

Length C is arbitrary and not related to the radius. The sides can equal length A to make squares or can equal length C to increase the height of the doorway.

A 10th panel can also be added as a door.

MEASUREMENTS

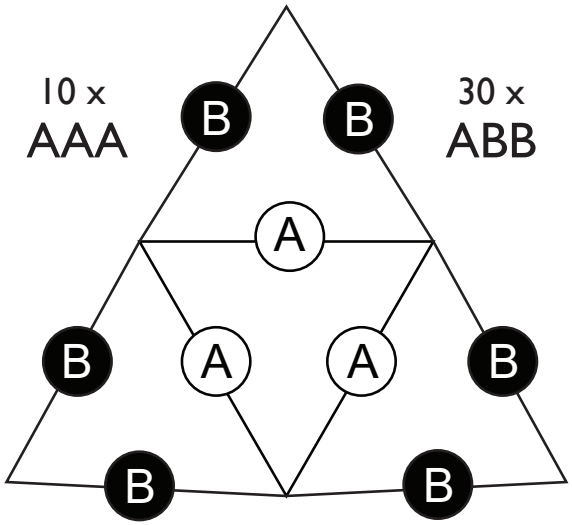
1

A = dome radius × 0.61803
B = dome radius × 0.54653

LENGTH A =

LENGTH B =

2



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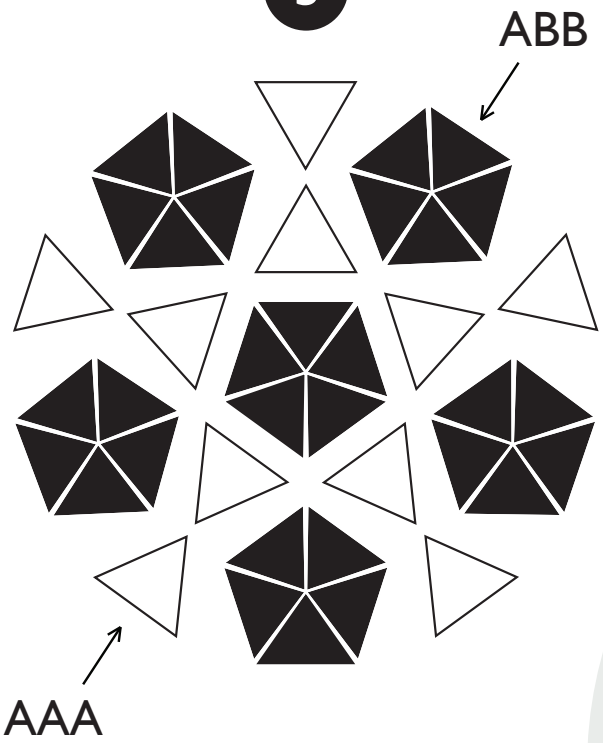

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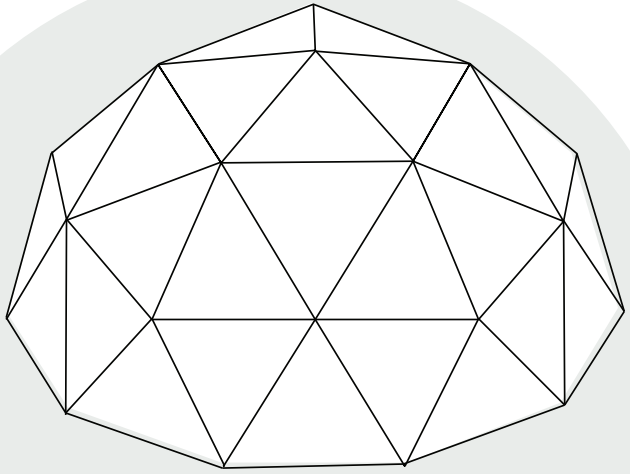


A AND B LENGTHS

To find the A and B lengths required for all of the panels, first determine the radius (half of the diameter) of the dome you want to build. Then multiply the radius by the numbers in step ❶ to find each length.

These instructions will theoretically allow you to build any size dome, but example measurements given here will relate to a 260cm diameter dome. 260cm is large enough for adults to get inside, but small enough that you can build it without steps.

1200mm x 800mm double walled cardboard sheets are used as toppers for Euro pallets and are the perfect size for a 260cm dome.

Calculations for A and B lengths for 260cm diameter dome (in mm):

A = 2600/2 x 0.61803 = 803.44
B = 2600/2 x 0.54653 = 710.49

The calculation for C length is based on the size of the cardboard. You can make squares by using the A length or you can add a bit to make the dome higher.

C = A + ≤400

At this scale the lengths can be rounded down by a few milimetres for ease

A = 800
B = 710
C = 1000

EXTRA INFORMATION

CARDBOARD

Euro pallet sized (1200mm x 800mm) double-walled cardboard sheets are easily available. This is the perfect size sheet for a 260cm dome, producing two triangle panels or a single wall panel from each sheet (30 total).

The C lengths are not dependent on a ratio to the radius and can be extended or reduced to increase or decrease the doorway and roof height.

CUTTING

Measure and cut one of each triangle, then use that as a template for all the rest. A wooden template is more durable, but consider removing the centre for weight.

Lay out your triangles to avoid cutting every side - in the examples below we used the edges of the cardboard to mitigate one cut on each triangle, then made a shared cut through the middle to leave only one side to cut on each triangle.

DECORATION

Cardboard is made of cellulose fibres, which absorb water. When you apply paint, especially with a lot of water, the cardboard swells and can warp or curl which is obviously undesirable when building a dome.

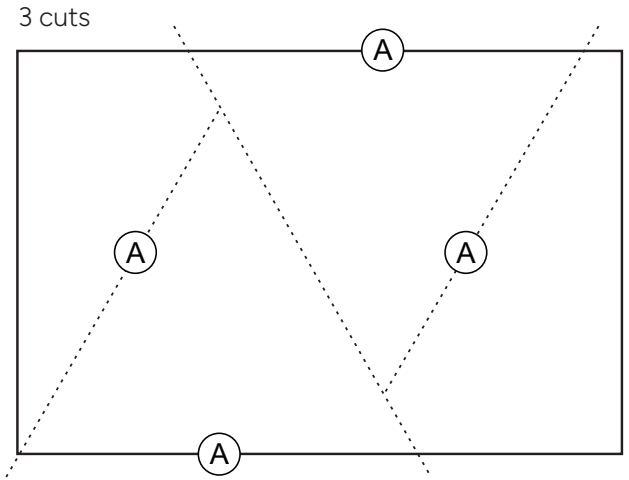
The easiest solution we found was to use ready-mix paint and stencils to decorate the panels. The stencils were laser cut in our case, but could easily be cut by hand.

GUMMED TAPE

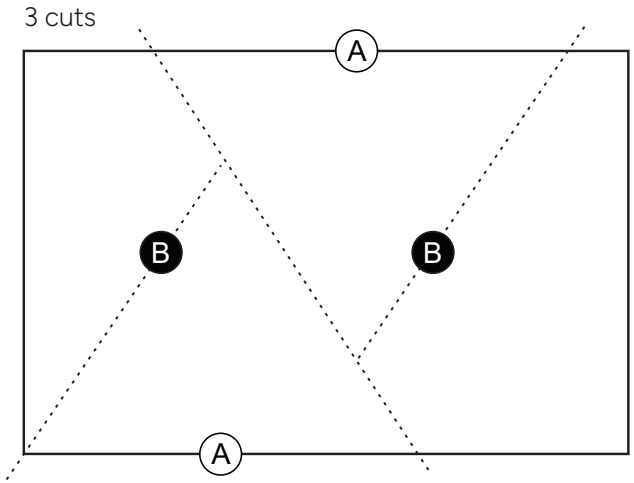
The best tape for constructing a dome is water-activated gummed paper tape (often called 'kraft' paper tape - from the German/Swedish meaning 'strength').

You'll need a bowl of water and a sponge to activate the tape. It helps to cut the lengths of tape to length beforehand.

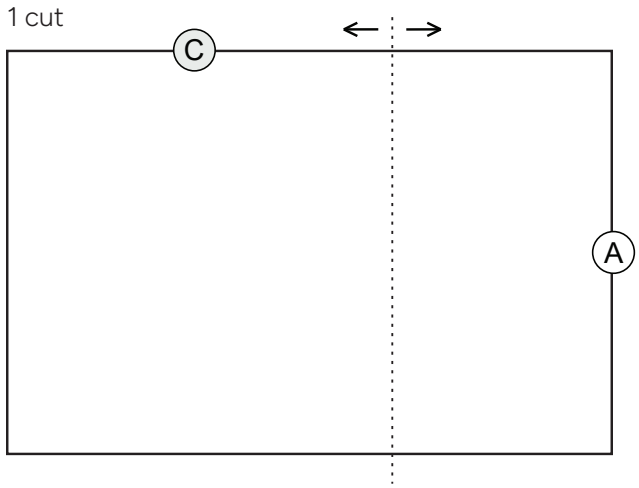
Make a simple tape ruler from a cardboard offcut with A & B lengths on either side.



Equilateral triangles (AAA) x 10 (5 sheets)



Isosceles triangles (ABB) x 30 (15 sheets)



Rectangles (ACAC) x 9 (9 sheets)

FULL BUILD

1 First join 5 of the 30 ABB triangles. Lay them flat, face down. Make sure the edges butt up against each other (there will be one gap). Tape four joins - flip it over and repeat. The pentagon will be flat until the last join is taped and pulls the shape into a dish. Taping the joins accurately will help later.

Pull the gap together and tape the last edge on both sides to finish the panel in a dish shape.

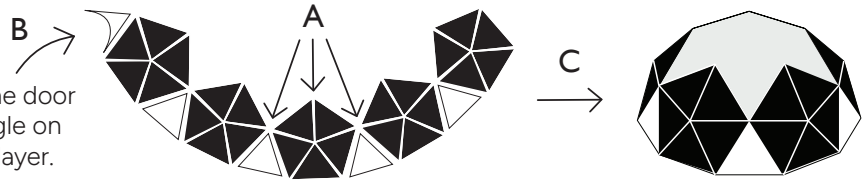
2 Make SIX of these pentagonal dish panels:

Put one aside as the top

3 Join 1 of the 10 AAA triangles between two of the dish panels, and tape on both sides.

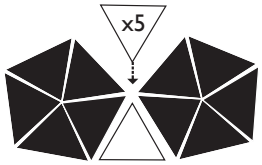
Make two of these triangle and panel constructions:

4 Use 2 more of the AAA triangles and the 5th pentagonal panel to join the panel constructions from Step 3 to each other (A). Tape all edges. Add the door triangle to the last pentagon (B). Lift (use the 5 top points of the pentagons) and move into a dome shape (C). (You need a few helpers to stay inside the dome until the end now...)

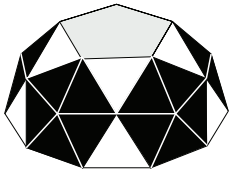


Use the door triangle on this layer.

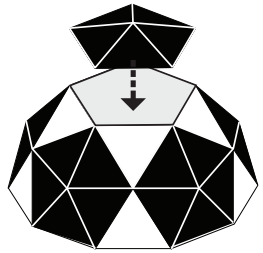
5 Tape the 5 remaining triangles to the gaps between the pentagon panels. Tape on both sides (helpers on the inside may need to push gently from the inside).



This will leave a pentagon shaped hole in the top of the dome.

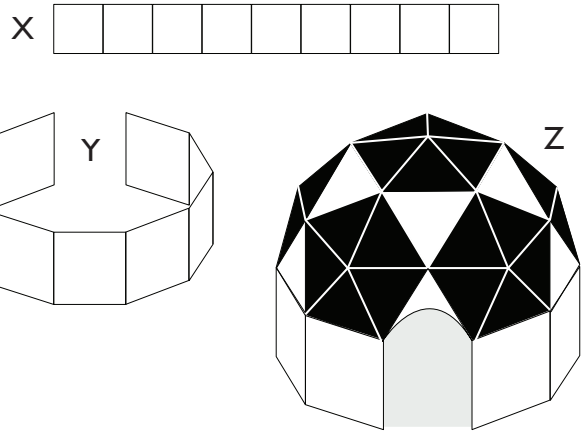


6 Tape the final pentagon to the top to finish the dome. You'll need the helpers inside to support the panel as you do this. You may need to manipulate the dome to make the panel fit.



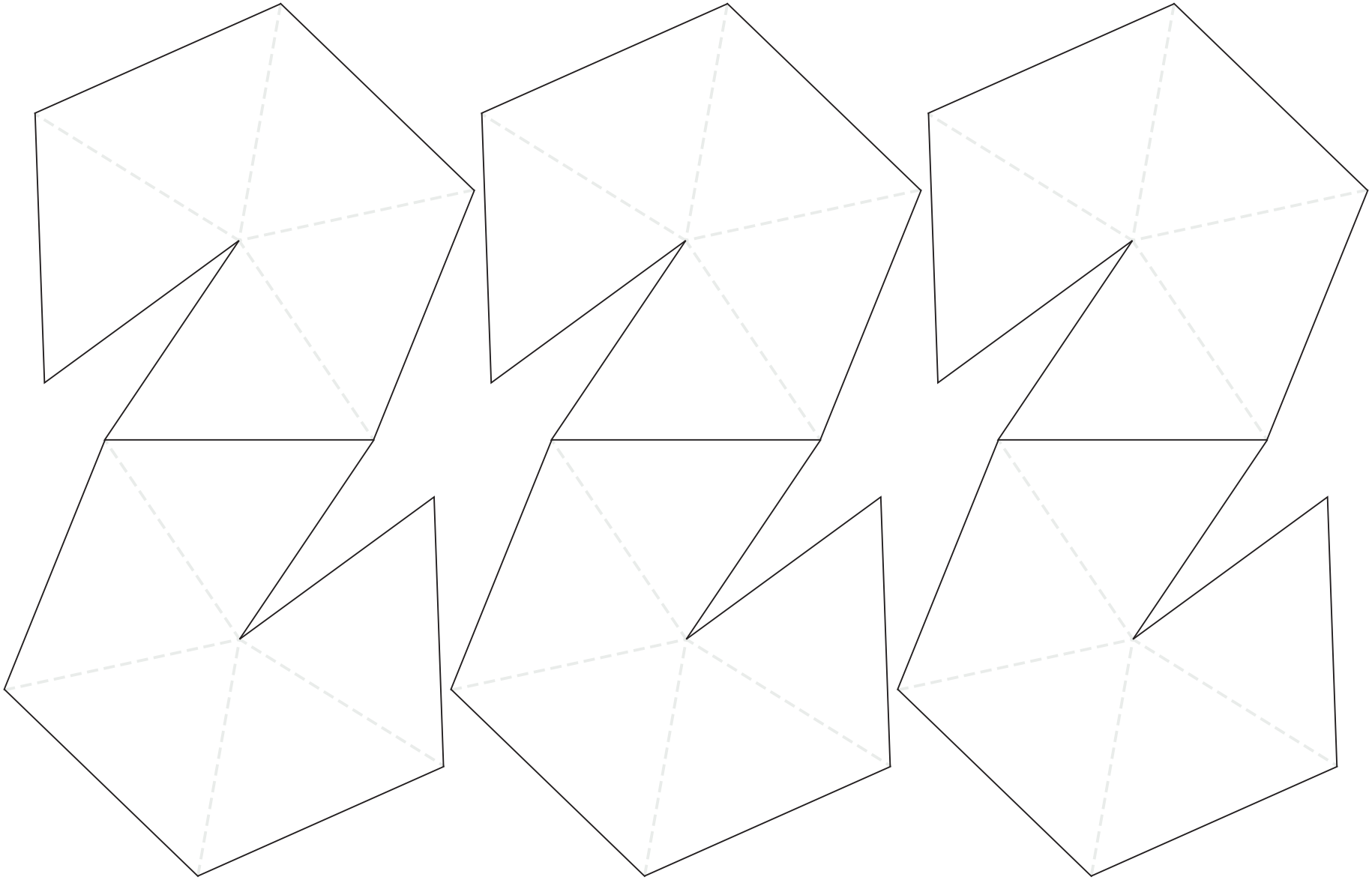
7 Lay the wall panels face up and tape the edges (X). Flip the wall face down and tape the inside edges. Stand the panels up and arrange the wall into a circle with a gap for the door (Y). This part can be done while the roof is being constructed.

Arrange the circle around the roof dome with a gap for helpers. Get 20 lengths of tape ready. Stand helpers between the wall and the dome, ready to lift the dome from the outside edges. As they lift they flip under the dome to end up on the inside. Tape the base edges of the roof to the top edges of the wall squares. Check that everything is taped inside and out (Z).



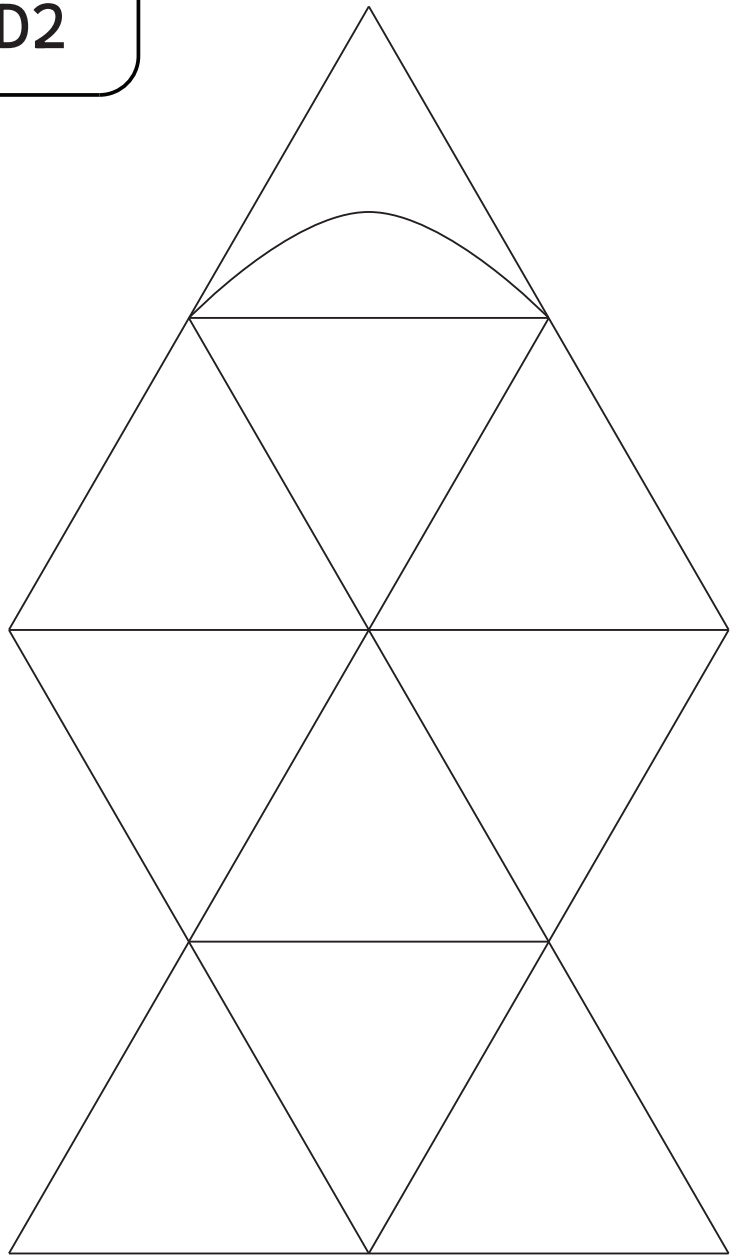
MD1

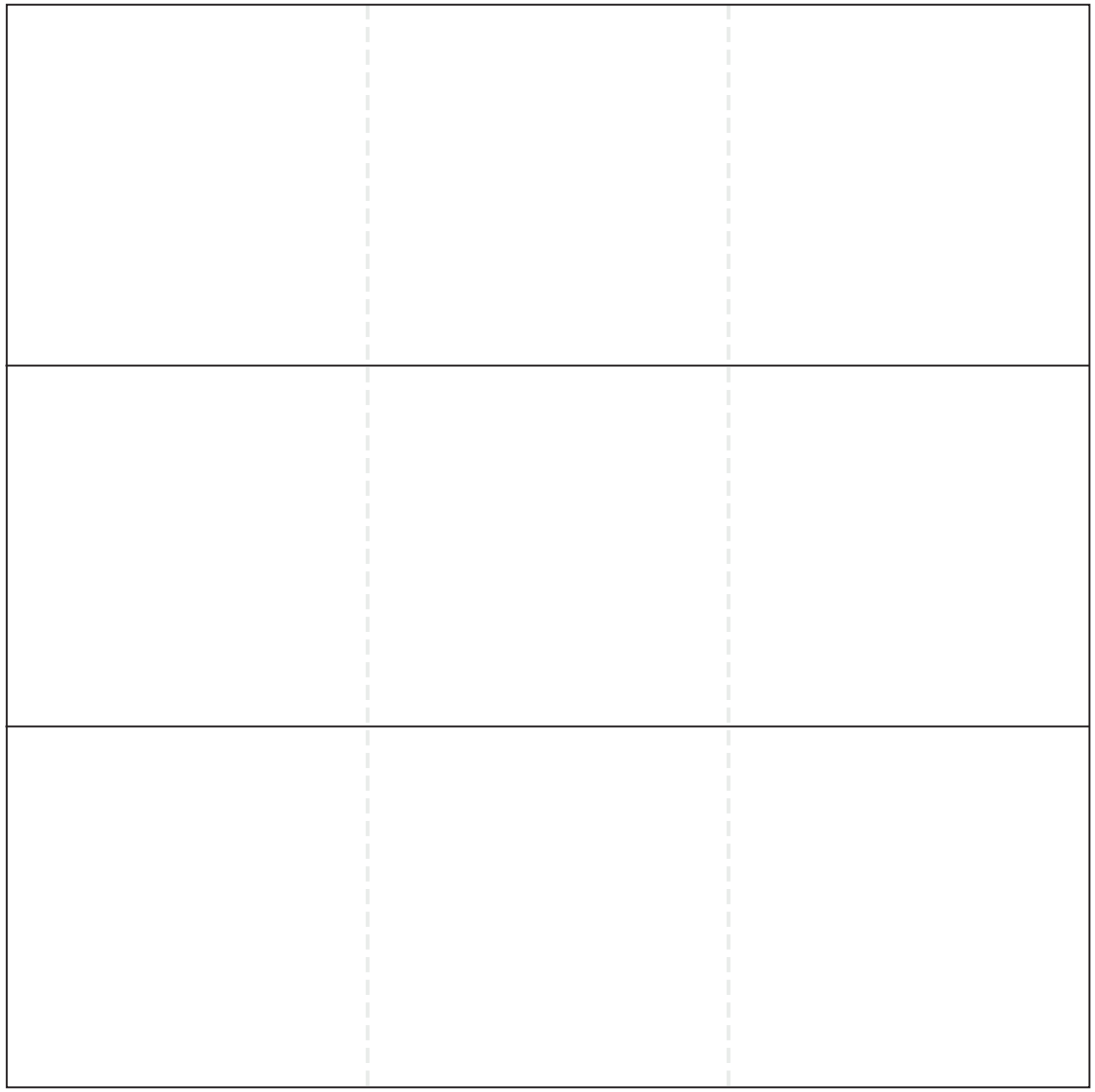
To make your own mini dome cut and score the panels on these two pages marked MD1 and MD2.
SCORE DASHED lines, then CUT SOLID lines.



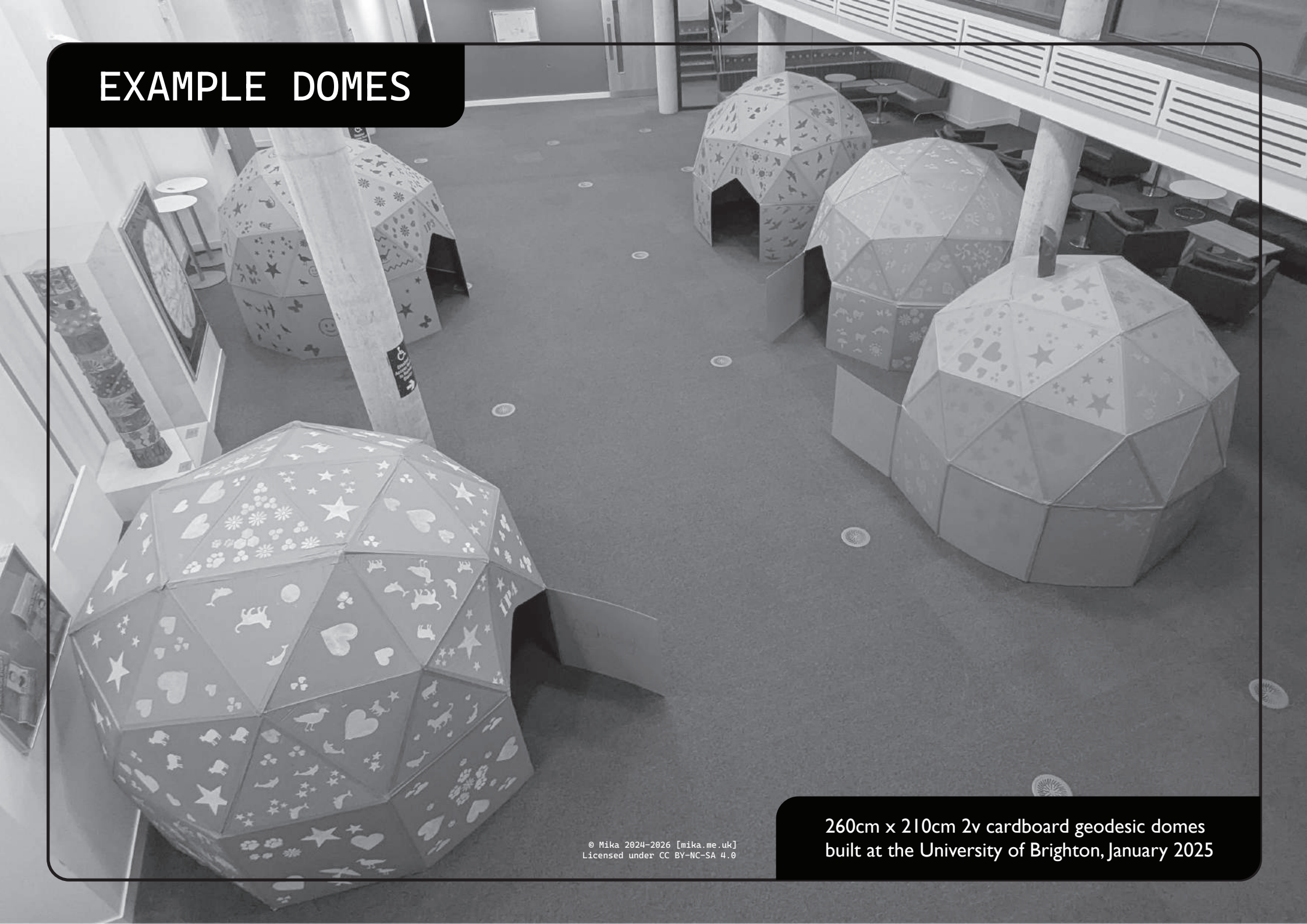
MD2

SCORE DASHED lines, then CUT SOLID lines.





EXAMPLE DOMES



260cm x 210cm 2v cardboard geodesic domes built at the University of Brighton, January 2025