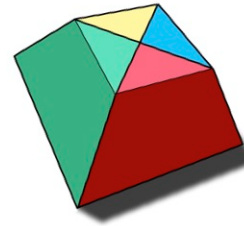


# Frustum



Easy  
4 squares  
4 colours or 1 colour



**Frustum** is the name given to a pyramid or a cone with its top cut off. **Frusta** do not have to be square based or circular based, and the cut removing the top does not necessarily have to be parallel to the base. The name covers all possible types of amputated convergence.

This particular Frustum is a classic four-sided pyramid with the top cut off parallel to the base at exactly half the height. When the original pyramid is viewed from the side, we observe an equilateral triangle (right side of Fig. 1). The sides themselves, however, each consist of an isosceles triangle with a height of 1 (left side of Fig. 1).

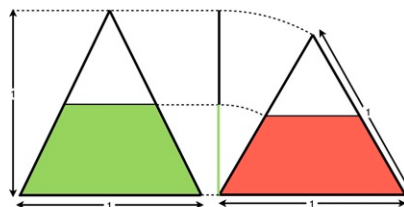


Fig. 1 One face compared to the side view of the Frustum

The top and the base of this Frustum are both squares, the top has a side length one half of the side length of the base. The modules consist of one of the four trapezia sides, one quarter of the base and one quarter of the top. Here are nets for the exposed part of one module and the entire Frustum.

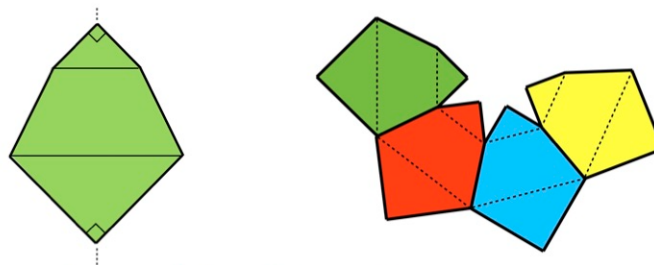
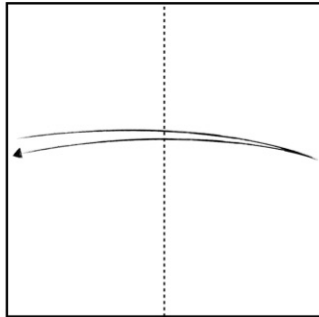


Fig. 2 The nets of one module and the entire Frustum

These lengths and angle are easy enough to produce in origami but the method of assembly contains a specific folding sequence, which has much in common with tessellation folding. So, if you have worked with that, this will seem quite straight forward – if not, follow the instructions carefully.

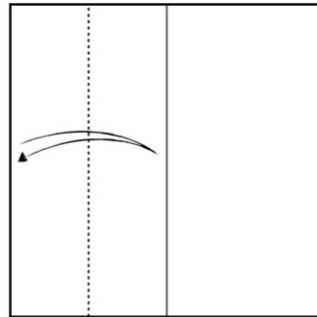
## Folding the Module

1



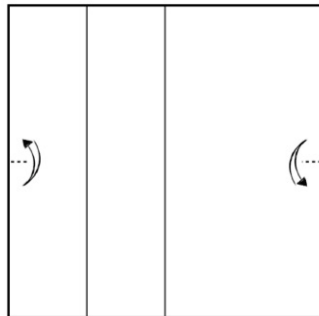
Crease the vertical centre line.

2



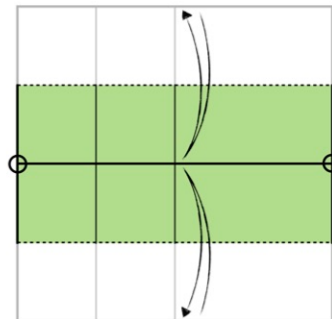
Crease the left quarter line.

3



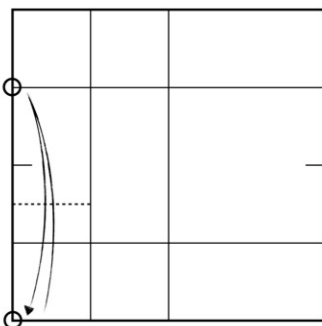
Make two small reference creases at the mid points of the vertical edges.

4



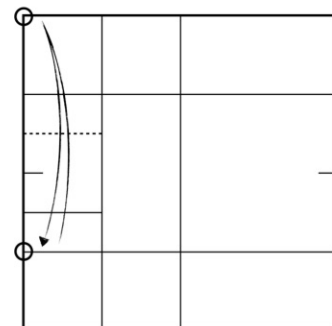
Use the reference creases to fold the upper and lower horizontal quarter lines.

5



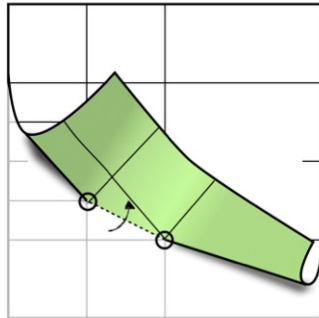
Bring the bottom-left corner up to meet the left edge of the upper quarter line and crease from the left edge to the left quarter line.

6



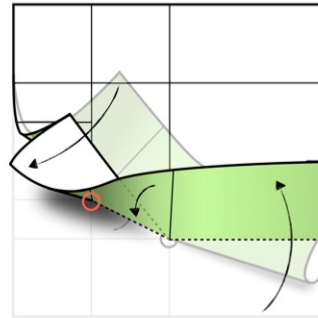
Bring the top-left corner up to meet the left edge of the lower quarter line and crease from the left edge to the left quarter line.

7



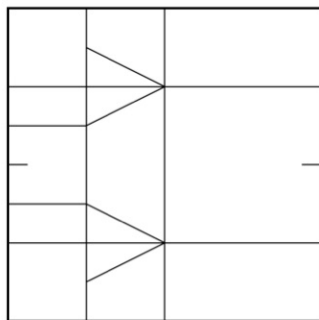
Fold from the point where the crease made in step 5 meets the left quarter line and the intersection of the vertical centre line and the lower quarter line.

8



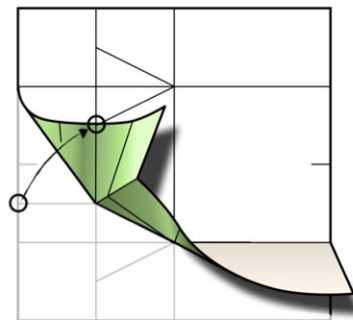
Make an inside reverse fold as shown above. Fold only as far as the reference point marked in red.

9



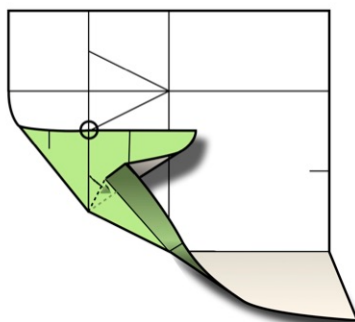
Unfold everything and repeat steps 7 and 8 for the top half. The crease pattern should now look like the above diagram.

10



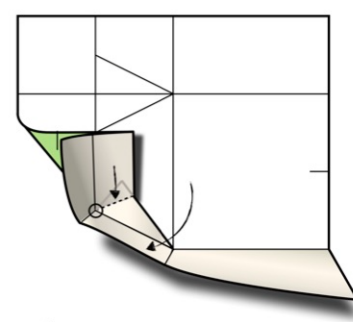
Bring the left edge of the crease made in step 5 over to meet the point where the right end of the crease made in step 6 meets the the left vertical quarter line. Take care not to fold the paper.

11



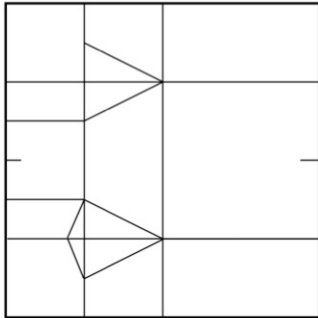
push the excess paper under the fold made in step 7, and press flat.

12



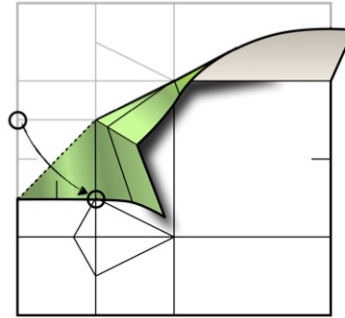
Bring the bottom-left part of the module over and press down the inside 'reflection' of step 11.

**13**



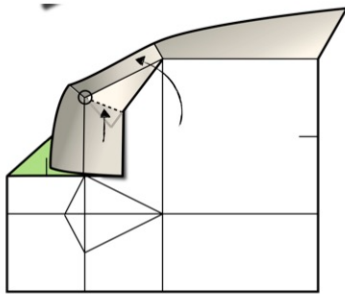
Unfold everything. The crease pattern should now look like the above diagram.

**14**



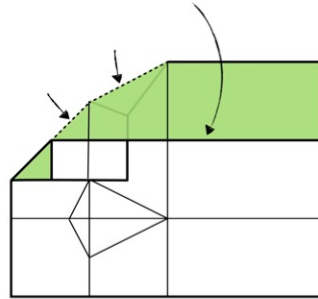
Bring the left edge of the crease made in step 6 over to meet the point where the right end of the crease made in step 5 meets the the left vertical quarter line. This time, fold the paper.

**15**



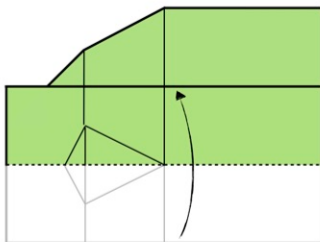
Repeat steps 11 and 12 for the other half of the module.

**16**



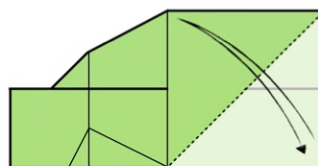
Fold the top quarter of the module over, creating the upper edge along the existing edge on the layer below.

**17**



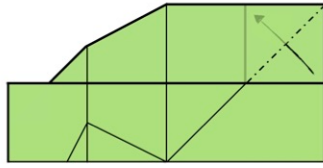
Fold the lower quarter on to the module.

**18**



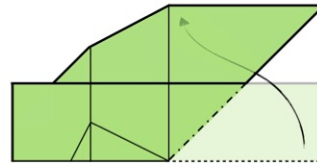
Diagonally cease all the layers on the right side of the module as shown above.

**19**



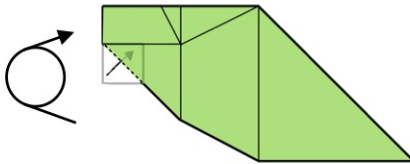
Fold the top layer from the diagonal crease in step 18 inside the module

**20**



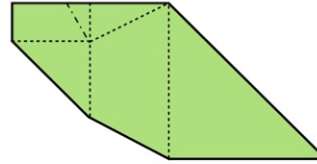
Make an inside reverse fold to tuck the bottom-right corner inside along the diagonal fold made in step 18.

**21**



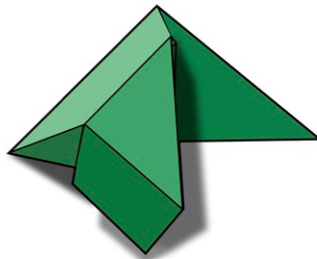
Flip the module over vertically and tuck the extruding tab on the left inside the module.

**22**



Make mountain and valley folds according to the above diagram along existing creases.

**23**



Following the folds made in step 22, reshape the module so that it looks like the above diagram. You need to make another 3 of them before moving on to the assembly process..

## Assembling the Model

Begin with the top corners. In the photograph below, the 'thorn' on the green module tucks into the pocket inside the slot on the red module.



Fig. 3 Joining the top corners (internal view)

Join three modules together like this, leaving the large triangular tabs at the bottom til last.

To add the fourth module, you will need to ease out the first joint and make the last and fort top-corner joint simultaneously. in the photograph below, the final piece is the red one.



Fig. 4 Making the top-corner joint of the last module.

Turn the model upside down and slip the large triangular labs into the neighbouring slots. The last one will need to be twisted slightly to fit.



Fig. 5 Inserting the large triangular tabs.

Finish by massaging the model into its final shape.