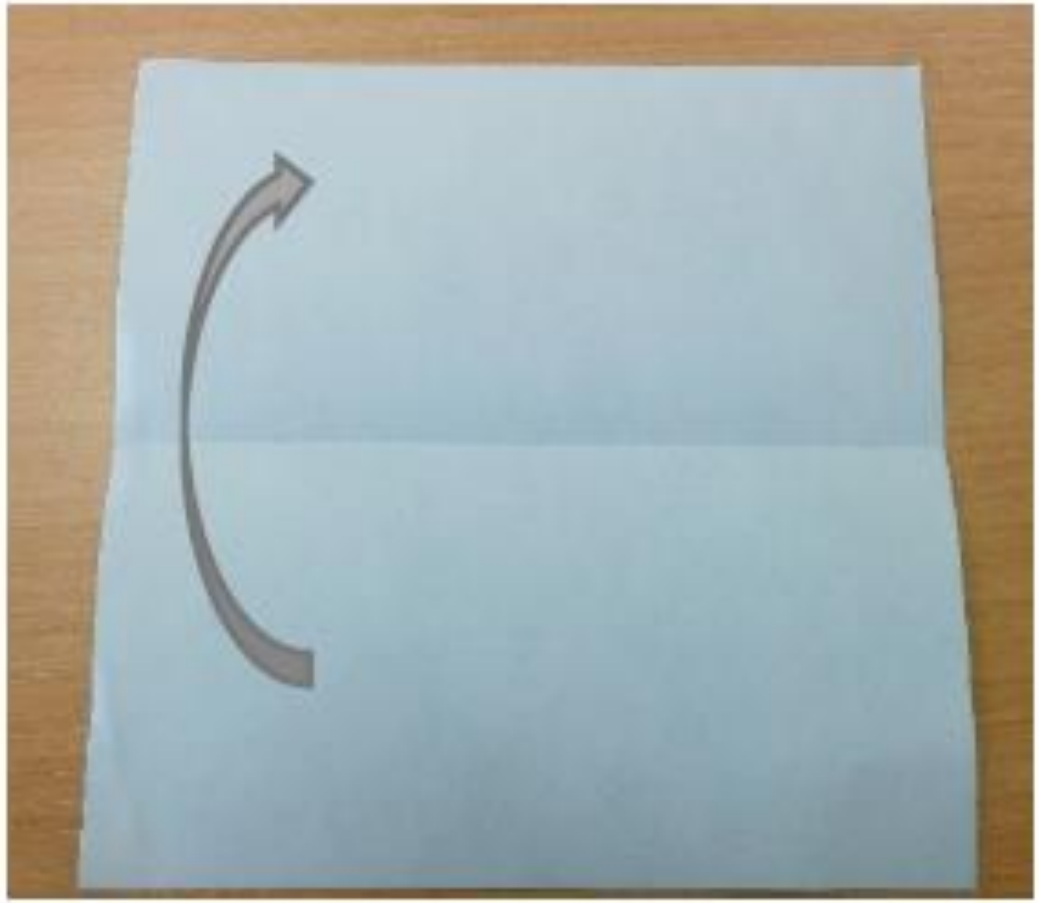
MATHEMATICAL ORIGAMI

SONOBE CUBE

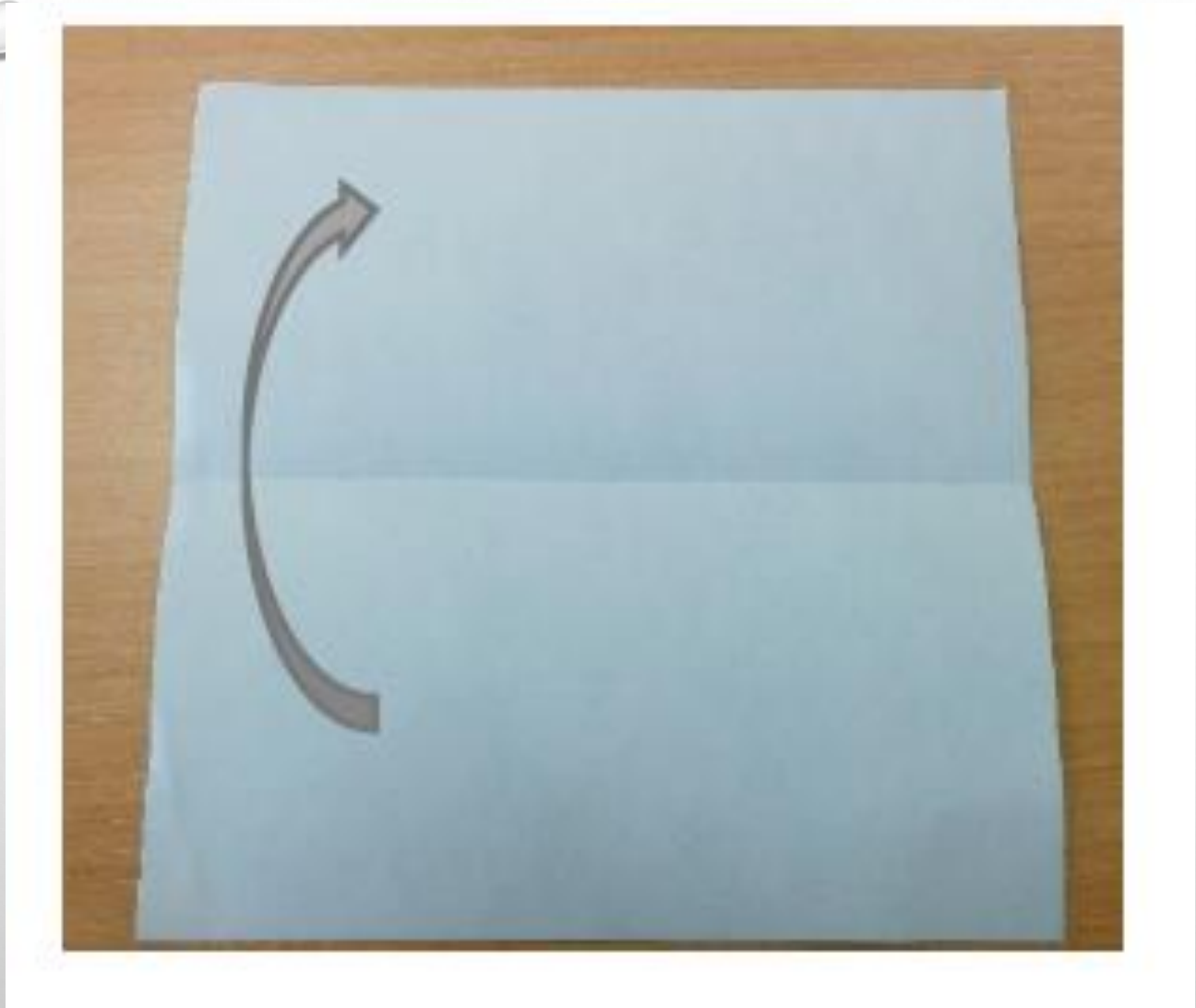
Have you ever thought how you can use Origami to make some fantastic mathematical 3D Shapes. Well we can. We can make SONOBE's and by interlinking these, we are able to make 3d Shapes such as cubes, octahedrons, icosahedrons and more.

These slides will show you how to make one SONOBE and then by making multiples you can slot these together to make the different shapes. There is also a worksheet to help with how to make them and a link to a YouTube video that shows you in case you need more help.

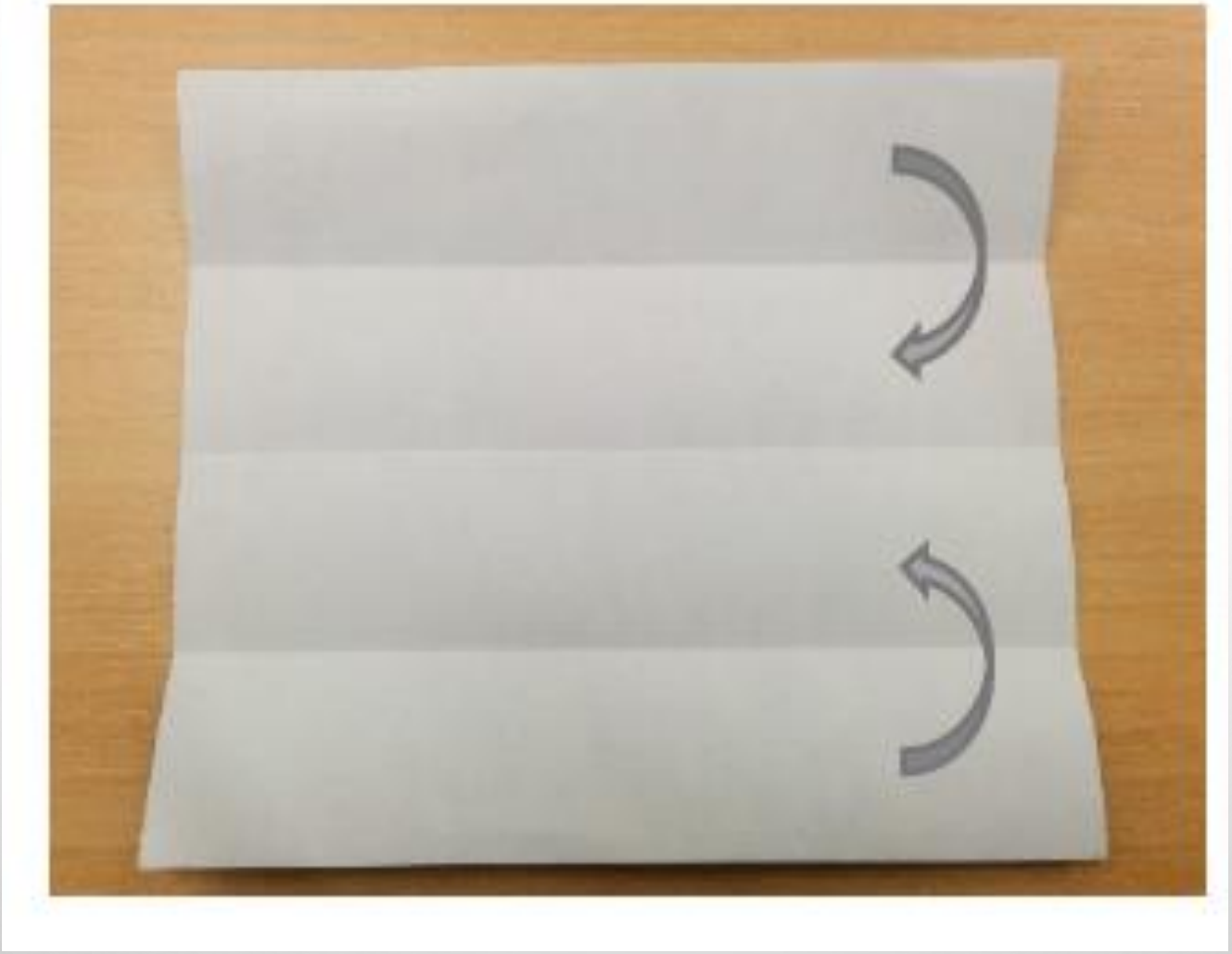
Have fun and see what mathematical decorations you can make.



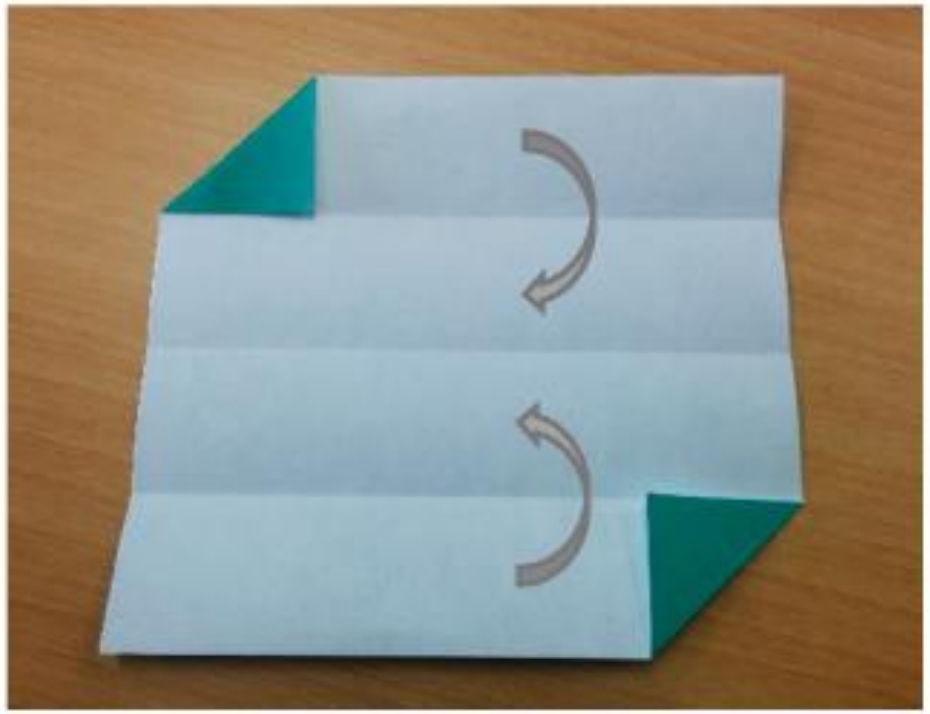
Start with a square piece of paper 10cm x 10cm

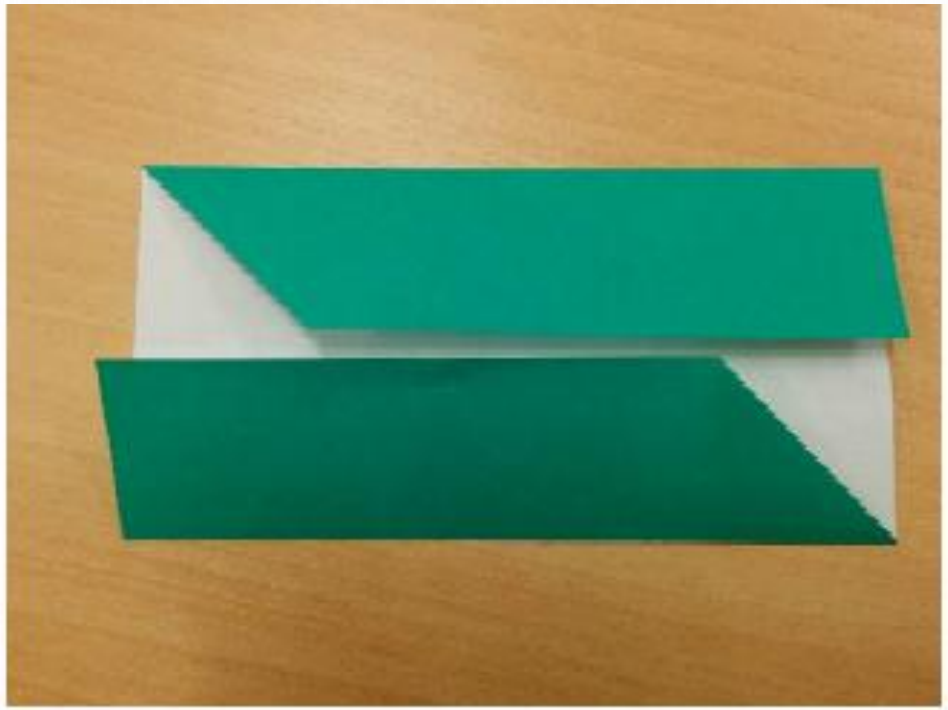


Fold the square in half.



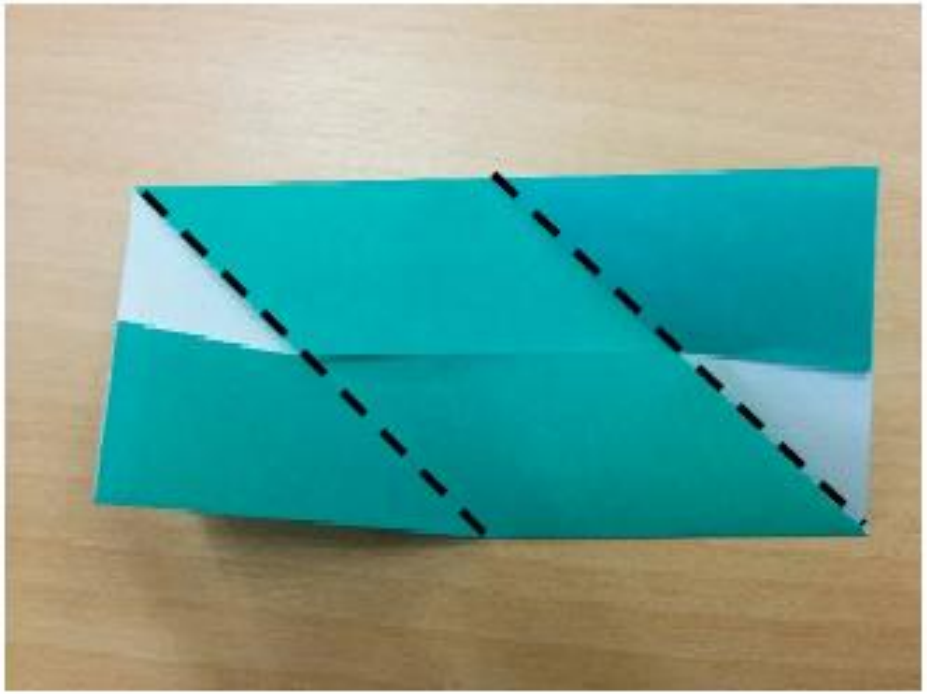
Fold the edges of the square to the centre fold.





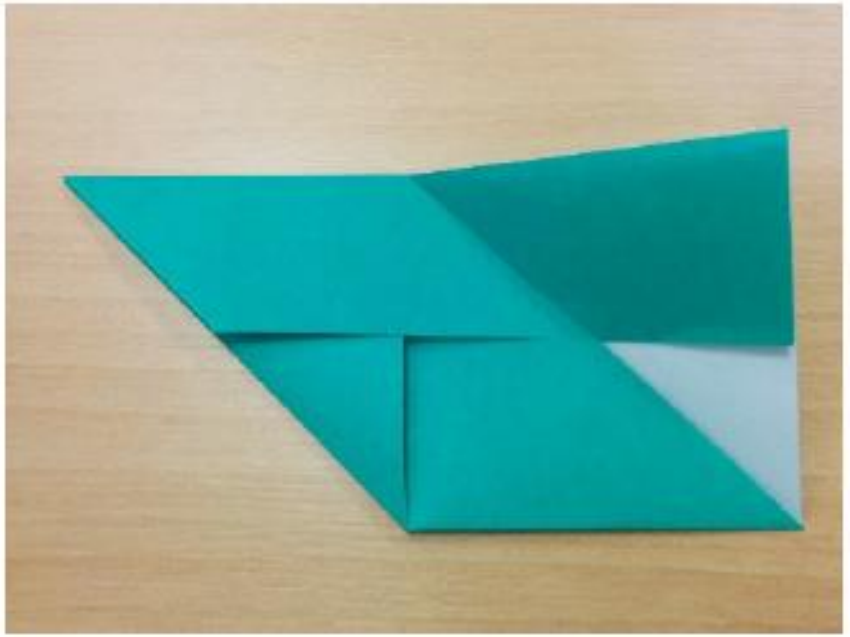
Fold corners diagonally, then fold along the top and bottom horizontal creases again.

3) Make two diagonal folds inwards along the dotted lines, then unfold.



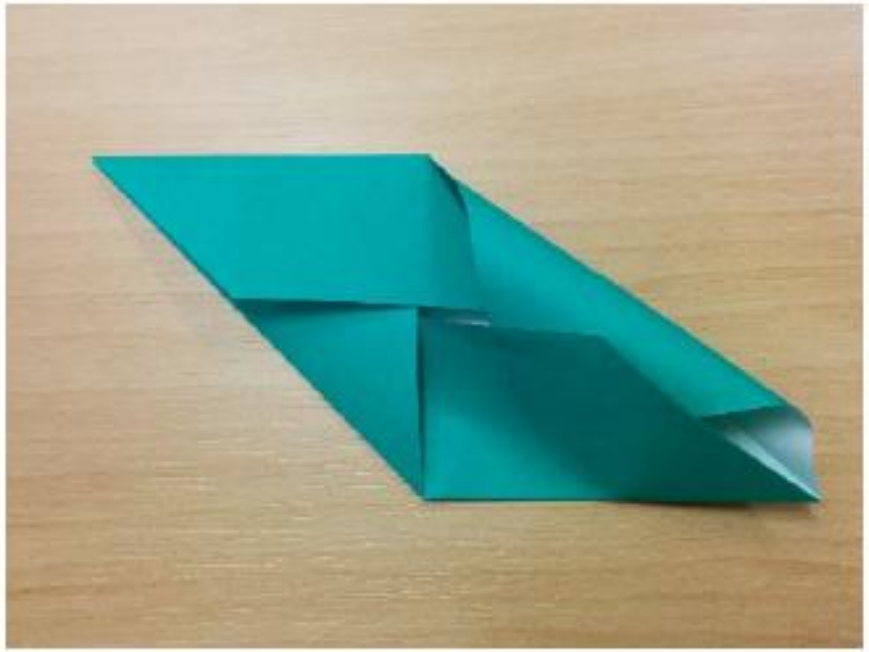
Fold diagonally as shown, then unfold.

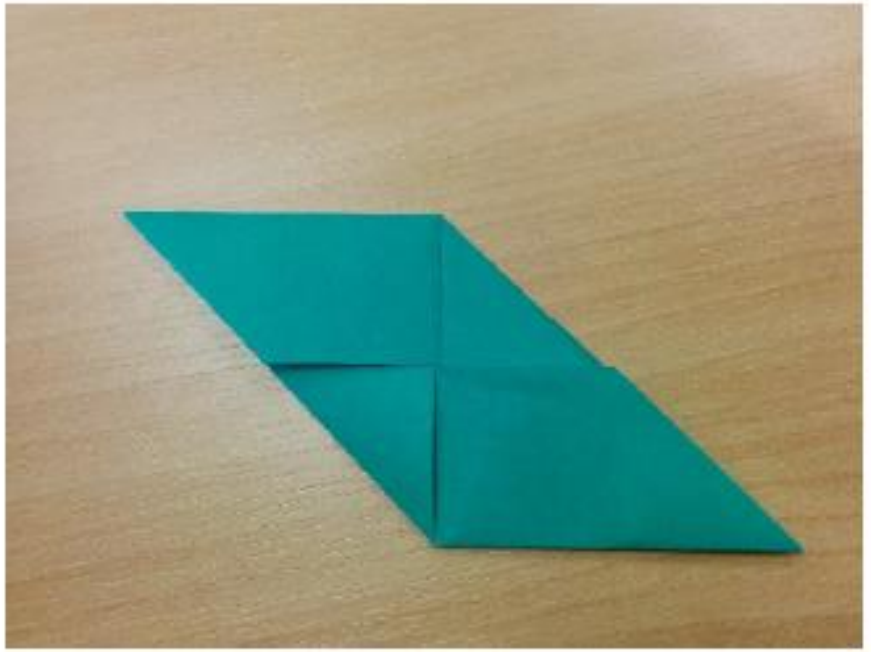
4) Fold along the left-hand diagonal crease again, but this time tuck the corner underneath the top crease.



Tuck left-hand corner under top crease.

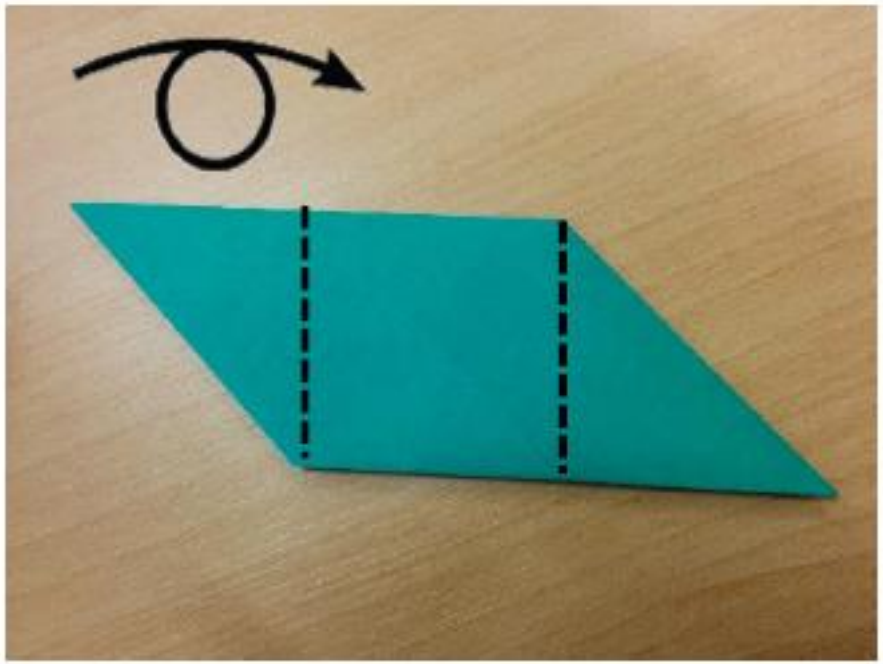
5) Repeat with the right-hand diagonal crease, tucking the corner underneath the bottom crease.

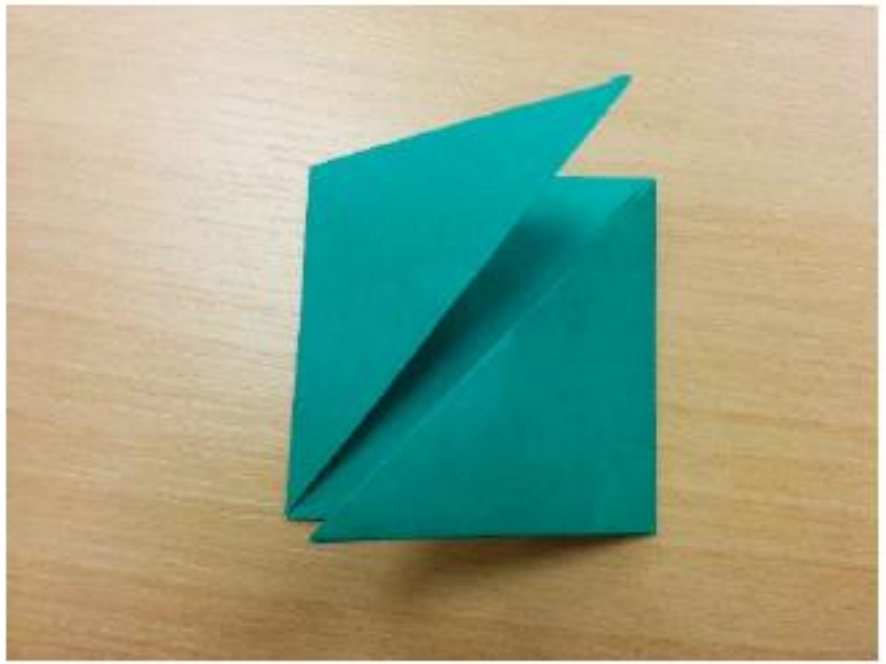




Tuck right-hand corner under bottom crease.

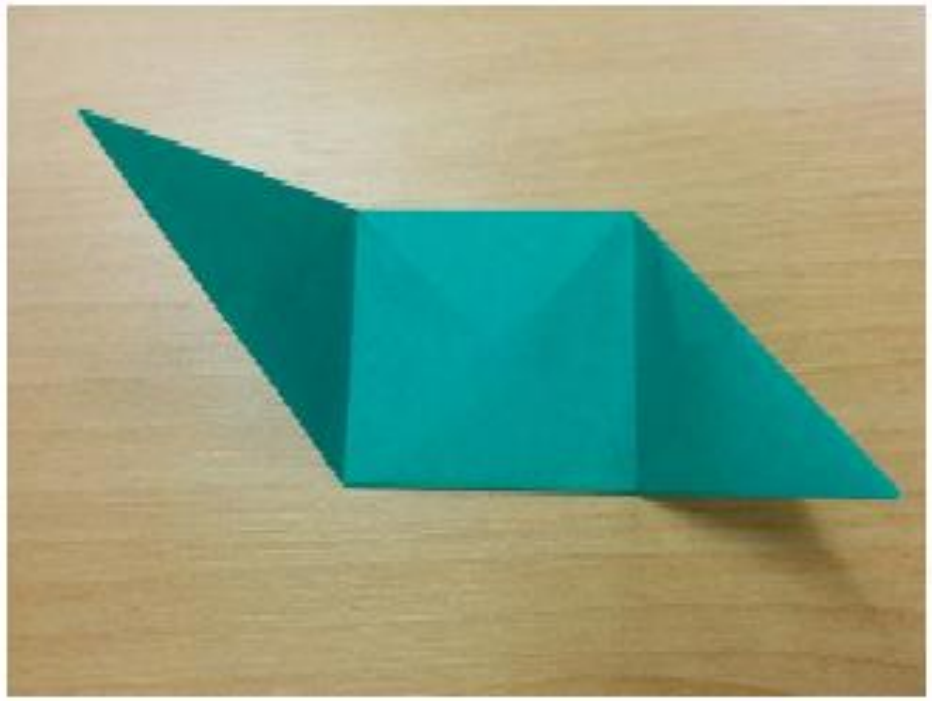
6) **Turn the unit over.** Fold the sides inwards along the vertical lines.





Fold along vertical lines shown, then unfold.

7) Your Sonobe module is complete!



You will need 6 Sonobe units to make a square, 12 to make an octahedron, and 30 to make an icosahedron.

https://www.youtube.com/watch?v=2ytYLg8dZLM

Use the link to help you see how to make a SONOBE and how they can be linked together.

6 pieces will make a cube. A cube is also known as a hexahedron.

Here are two of the pieces fitted together.

12 pieces will make a stellated octahedron. Stellated means that it has points.

30 pieces will make a stellated icosahedron. This has 20 points.

WHICH ONES CAN YOU MAKE?

Slide the pieces together to construct different polygons and other objects.

How many pieces do you need to make a cube?

What fraction of the original square is left after each fold?

What are the size of the angles created after each fold?