

Decagonal Kaleidocycle



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Acknowledgements

The pointed peyote oval shape is originally by Diane Fitzgerald, and is one of the many peyote shapes described in her wonderful book: *Diane Fitzgerald's Shaped Beadwork: Dimensional Jewelry with Peyote Stitch*, Diane Fitzgerald, Lark Jewelry Books, 2009 (ISBN 1600592775). Diane also has tutorials available from her Etsy store: *DianeFitzgeraldBeads*.

This kaleidocycle is based on the dimensions of the half-closed decagonal kaleidocycle by *Gijs Korthals Altes*.

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Instructions

Overview

This kaleidocycle is made from ten tetrahedrons. Each tetrahedron is made from six peyote ovals. There are two different types of tetrahedra and each of these contains four different types of ovals.

The peyote ovals have a size 8 seed bead as the point beads in the last round. These are then used to join the ovals together to form the tetrahedra. The tetrahedra are then connected to each other with jump rings through the point beads to make hinges and form the kaleidocycle.

Materials list

- Size 11 Delica beads:

DB 1455	<i>Light smoke silver-lined opal</i>	6 g	A
DB 252	<i>Ceylon grey</i>	10 g	B
DB 251	<i>Opaque smoke grey luster</i>	6 g	C
DB 1851	<i>Galvanised light smokey pewter</i>	2 g	D
DB 335	<i>Matte galvanised silver</i>	2 g	E
DB 48	<i>Silver-lined grey</i>	2 g	F
DB 611	<i>Dyed silver-lined wine</i>	2 g	G
DB 2135	<i>Duracoat opaque juniper berry</i>	2 g	H

- Size 8 Miyuki seed beads:

451	<i>Gunmetal</i>	2 g	I
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- 20 × 6mm silver-coloured jump rings (**must be able to fit through the size 8 beads**)
- Size D Nymo, grey
- Size 12 beading needle
- Pliers

Making the Ovals

There are 8 different oval patterns in total: two different colourways each of four different sizes. You will need to make 5 of some and 10 of others as indicated, but you will have a total of 60. The patterns for each oval are shown in the following sections. Note that the diagrams use false colours for the grey beads (**A, B, C**).

Use a fairly firm tension, so that the oval will maintain its shape when part of the kaleidocycle – make sure you hold the tail thread as you work to keep the tension constant. As you add rows 4 and 5 the oval should stop being flat and pull into a convex shape.

Before you add the size 8 point beads make sure that a jump ring can fit through them.

Stitch all the tail threads in. For some of the ovals you will need to leave the working thread exiting from one of the point beads, as directed in each pattern. This is then used to join the ovals together to make a tetrahedron.

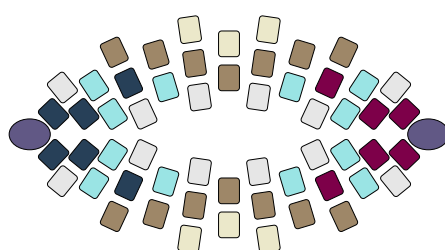
Tiny Oval – Pattern 1

On 80 cm (30 inches) of thread string the first two rows of the pattern starting from the middle of one of the increases ({**B**, **A**} 2 times, **D**, {**A**, **B**} 2 times, {**B**, **A**} 2 times, **D**, {**A**, **B**} 2 times). Leave a 15 cm (6 inch tail) and pass through the first 9 beads again to form a ring and exit from the first of the **B** strung, ready to stitch the first increase of round 3 of the pattern.

Stitch the next 3 rows of peyote following the diagram below. In the last round the two increases are replaced by a size 8 point bead (**I**). Before adding these beads make sure that a jump ring can fit through them.

Stitch in the tail thread. Leave the working thread exiting from the point bead on the red (**G**) side – the right-hand side in the diagram below.

Make 5.



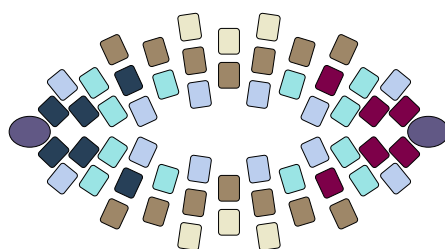
Tiny Oval – Pattern 2

On 80 cm (30 inches) of thread string the first two rows of the pattern starting from the middle of one of the increases ({**B**, **C**} 2 times, **D**, {**C**, **B**} 2 times, {**B**, **C**} 2 times, **D**, {**C**, **B**} 2 times). Leave a 15 cm (6 inch tail) and pass through the first 9 beads again to form a ring and exit from the first of the **B** strung, ready to stitch the first increase of round 3 of the pattern.

Stitch the next 3 rows of peyote following the diagram below. In the last round the two increases are replaced by a size 8 point bead (**I**). Before adding these beads make sure that a jump ring can fit through them.

Stitch in the tail thread. Leave the working thread exiting from the point bead on the red (**G**) side – the right-hand side in the diagram below.

Make 5.



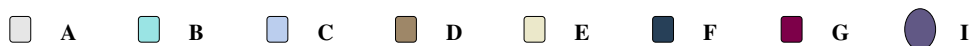
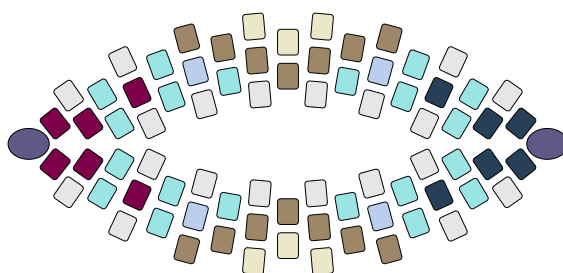
Small Oval – Pattern 1

On 80 cm (30 inches) of thread string the first two rows of the pattern starting from the middle of one of the increases (**{B, A}** 3 times, **D**, **{A, B}** 3 times, **{B, A}** 3 times, **D**, **{A, B}** 3 times). Leave a 15 cm (6 inch tail) and pass through the first 13 beads again to form a ring and exit from the first of the **B** strung, ready to stitch the first increase of round 3 of the pattern.

Stitch the next 3 rows of peyote following the diagram below. In the last round the two increases are replaced by a size 8 point bead (**I**). Before adding these beads make sure that a jump ring can fit through them.

Stitch in the tail thread and the working thread.

Make 10.



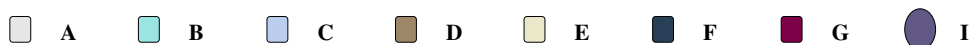
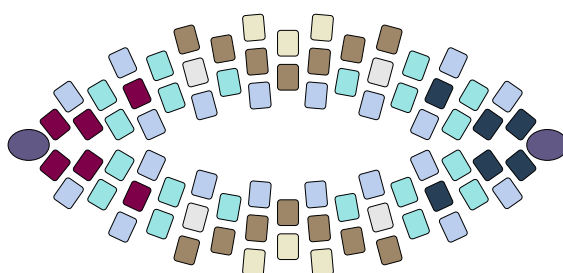
Small Oval – Pattern 2

On 80 cm (30 inches) of thread string the first two rows of the pattern starting from the middle of one of the increases (**{B, C}** 3 times, **D**, **{C, B}** 3 times, **{B, C}** 3 times, **D**, **{C, B}** 3 times). Leave a 15 cm (6 inch tail) and pass through the first 13 beads again to form a ring and exit from the first of the **B** strung, ready to stitch the first increase of round 3 of the pattern.

Stitch the next 3 rows of peyote following the diagram below. In the last round the two increases are replaced by a size 8 point bead (**I**). Before adding these beads make sure that a jump ring can fit through them.

Stitch in the tail thread and the working thread.

Make 10.



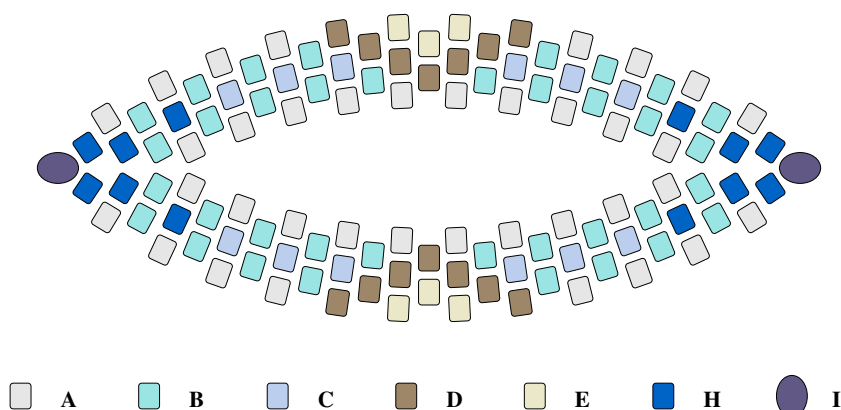
Medium Oval – Pattern 1

On 110 cm (45 inches) of thread string the first two rows of the pattern starting from the middle of one of the increases ({**B**, **A**} 5 times, **D**, {**A**, **B**} 5 times, {**B**, **A**} 5 times, **D**, {**A**, **B**} 5 times). Leave a 20 cm (6 inch tail) and pass through the first 21 beads again to form a ring and exit from the first of the **B** strung, ready to stitch the first increase of round 3 of the pattern.

Stitch the next 3 rows of peyote following the diagram below. In the last round the two increases are replaced by a size 8 point bead (**I**). Before adding these beads make sure that a jump ring can fit through them.

Stitch in the tail thread. Leave the working thread exiting from one of the point beads.

Make 10.



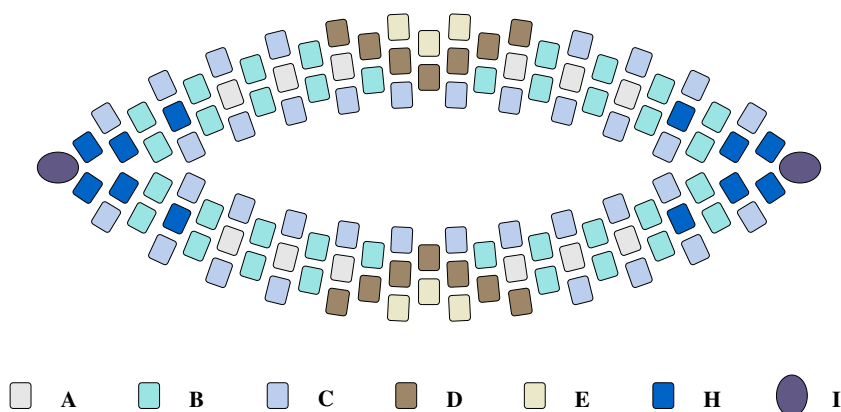
Medium Oval – Pattern 2

On 110 cm (45 inches) of thread string the first two rows of the pattern starting from the middle of one of the increases ({**B**, **C**} 5 times, **D**, {**C**, **B**} 5 times, {**B**, **C**} 5 times, **D**, {**C**, **B**} 5 times). Leave a 15 cm (6 inch tail) and pass through the first 21 beads again to form a ring and exit from the first of the **B** strung, ready to stitch the first increase of round 3 of the pattern.

Stitch the next 3 rows of peyote following the diagram below. In the last round the two increases are replaced by a size 8 point bead (**I**). Before adding these beads make sure that a jump ring can fit through them.

Stitch in the tail thread. Leave the working thread exiting from one of the point beads.

Make 10.



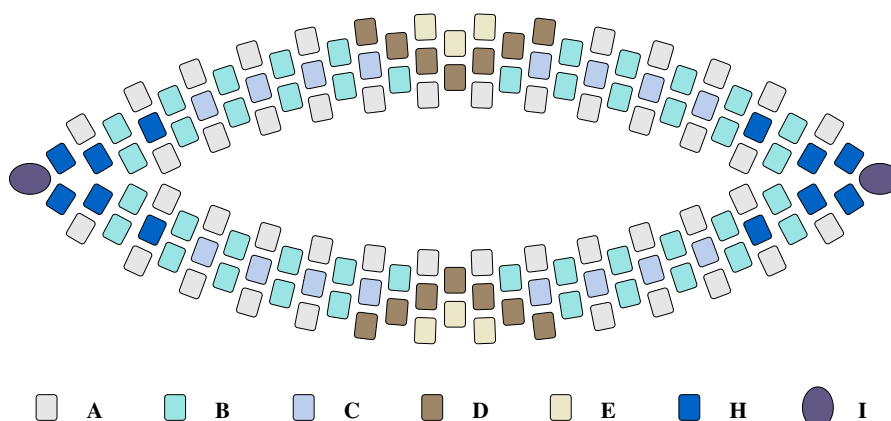
Large Oval – Pattern 1

On 110 cm (45 inches) of thread string the first two rows of the pattern starting from the middle of one of the increases ({**B**, **A**} 6 times, **D**, {**A**, **B**} 6 times, {**B**, **A**} 6 times, **D**, {**A**, **B**} 6 times). Leave a 15 cm (6 inch tail) and pass through the first 25 beads again to form a ring and exit from the first of the **B** strung, ready to stitch the first increase of round 3 of the pattern.

Stitch the next 3 rows of peyote following the diagram below. In the last round the two increases are replaced by a size 8 point bead (**I**). Before adding these beads make sure that a jump ring can fit through them.

Stitch in the tail thread. Leave the working thread exiting from one of the point beads.

Make 5.



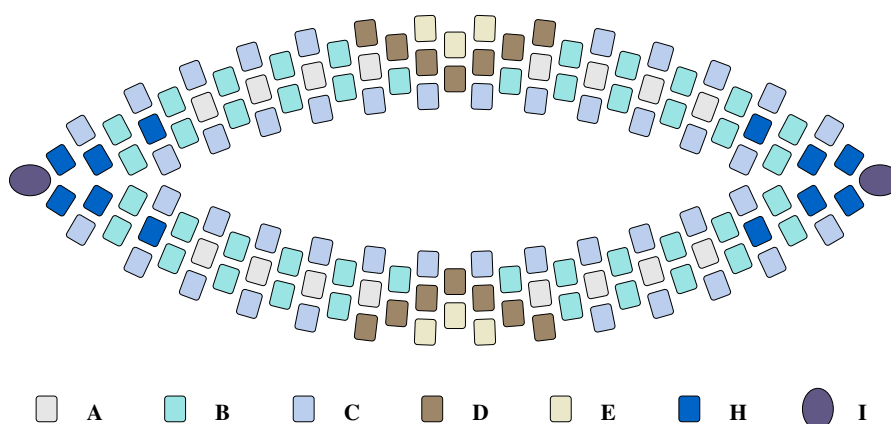
Large Oval – Pattern 2

On 110 cm (45 inches) of thread string the first two rows of the pattern starting from the middle of one of the increases ({**B**, **C**} 6 times, **D**, {**C**, **B**} 6 times, {**B**, **C**} 6 times, **D**, {**C**, **B**} 6 times). Leave a 15 cm (6 inch tail) and pass through the first 25 beads again to form a ring and exit from the first of the **B** strung, ready to stitch the first increase of round 3 of the pattern.

Stitch the next 3 rows of peyote following the diagram below. In the last round the two increases are replaced by a size 8 point bead (**I**). Before adding these beads make sure that a jump ring can fit through them.

Stitch in the tail thread. Leave the working thread exiting from one of the point beads.

Make 5.

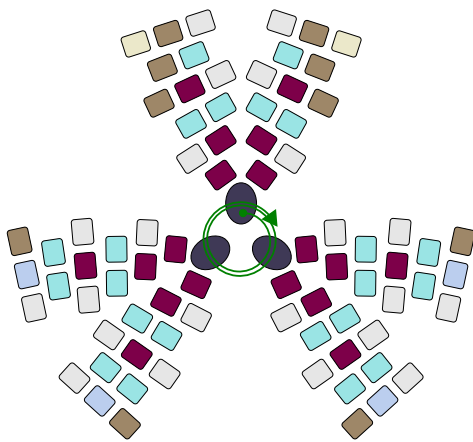


Joining the ovals together

Six ovals (one tiny, two small, two medium and one large) are joined together to make an irregular tetrahedron. The ovals sit over the edges of the tetrahedron, and three meet and are joined together at the vertices. Instructions for how to make this join are given below, followed by the joining patterns. There are two different joining patterns – pattern 1 and pattern 2 – which use the pattern 1 and 2 ovals respectively. You will need to make five of each pattern.

Joining three ovals to make a vertex

Join the point beads from each oval in a loop, as shown in the diagram below. The ovals should be aligned so they all have the concave side facing upwards towards the outside of the tetrahedron.



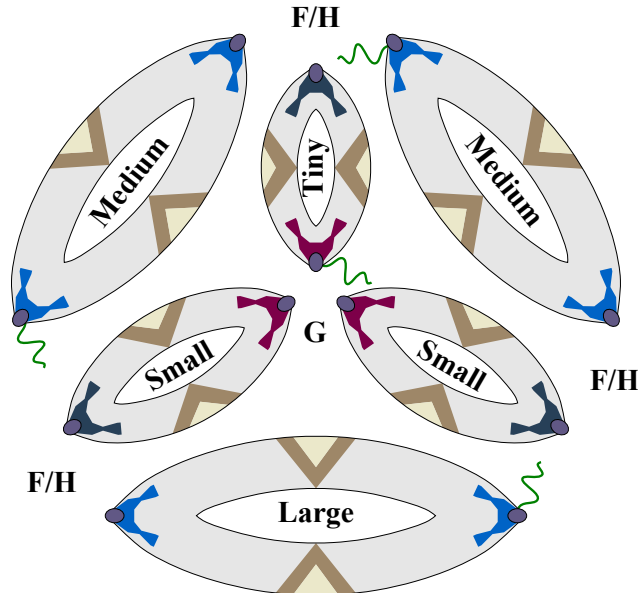
I used about 5 to 7 repeats of this thread path through the size 8 beads to make sure the hinges were not too loose, but this will depend on the beads, the jump rings and the thread. Check that a jump ring is able to slide through the bead (in the direction shown in the left-hand photo below), but not rotate too much in the other direction (as shown in the right-hand photo below). Once you are happy with the join, fasten off the thread securely by weaving it back into the oval.



Tetrahedron Pattern 1

Make 5.

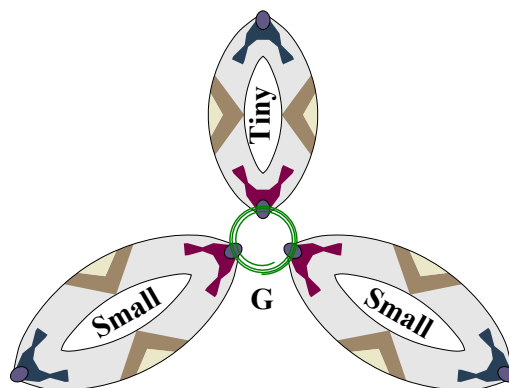
Lay six pattern 1 ovals – one **tiny**, two **small**, two **medium** and one **large** – out in the following pattern with the concave sides facing upwards:



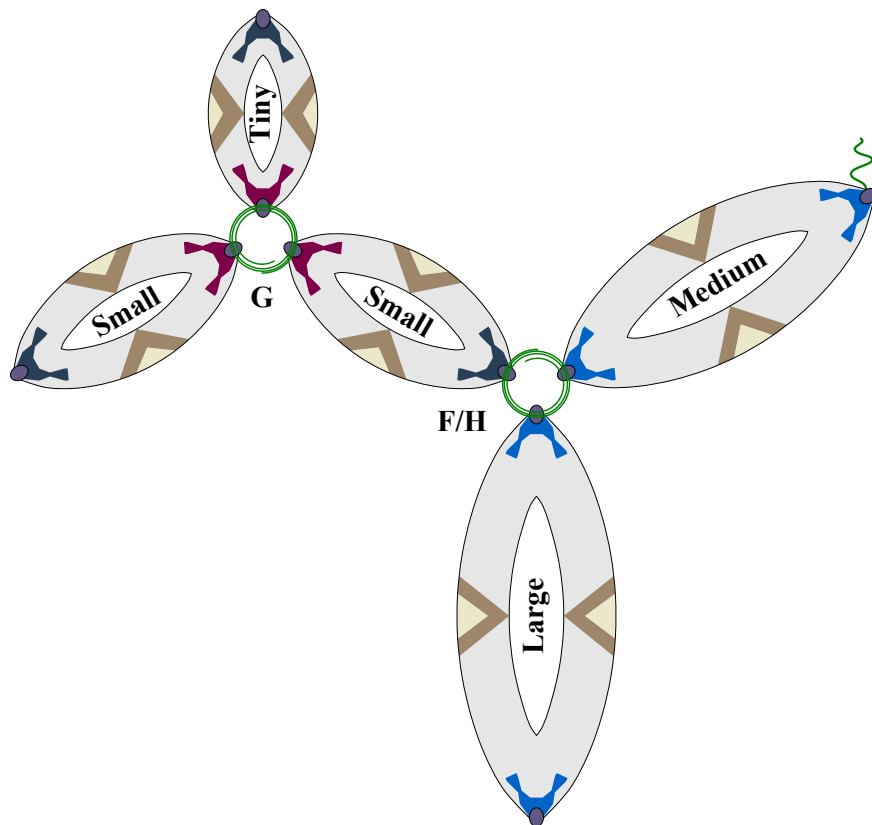
Note that the pattern 1 ovals are all light grey around the edges. The centre of the diagram (red, **G**) will be the top of the tetrahedron.

The positions of the remaining working threads are shown in green in the diagram (assuming the ovals were stitched in an anticlockwise direction, if not then the thread will exit the opposite side of the point beads).

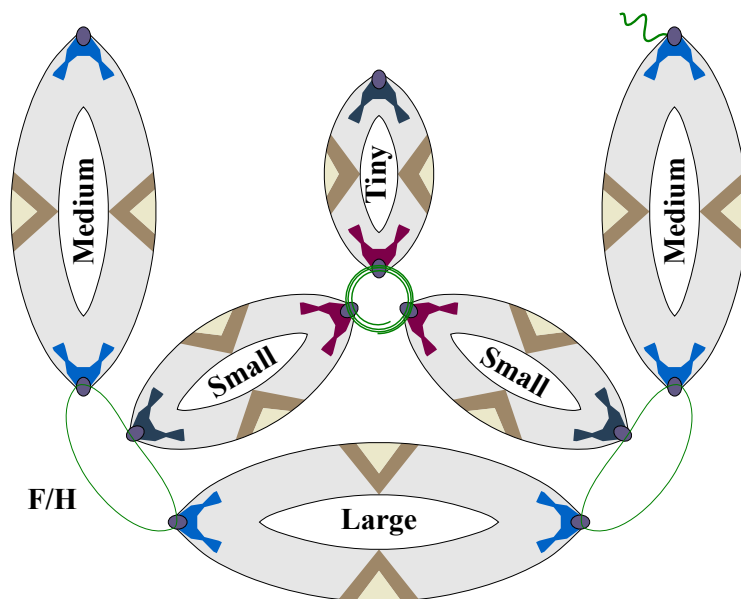
First start by joining the central three pieces together using the point beads on the red (**G**) end of the ovals:



Next join the **large** oval and one of the **medium** ovals to the central three as shown:

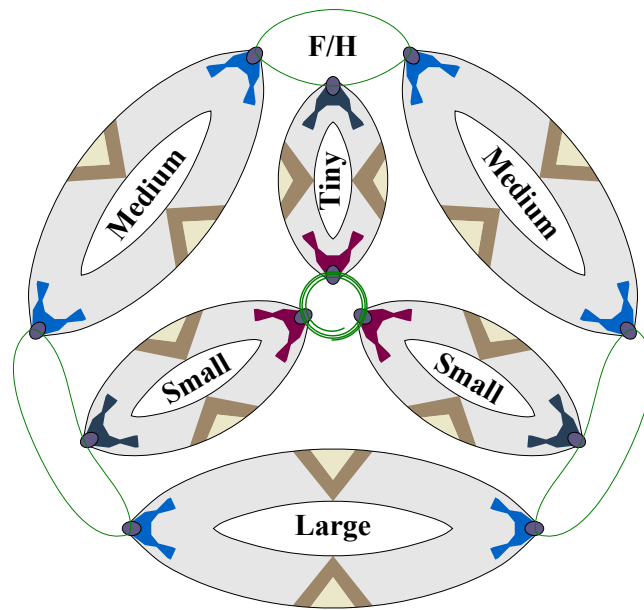


Now bring the **large** oval across so it can be joined to the other **small** oval from the central group and the one remaining unjoined **medium** oval, as shown below:



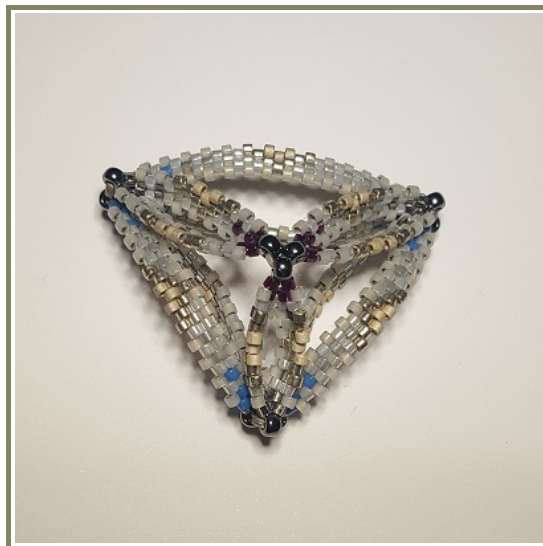
The diagram shows the beadwork flattened but the join is as before, and the central join (red, **G**) should now be above the other two.

Finally, join the three remaining free ends as shown below:



Again the joins are as before, and the central join should be above the other three.

You should now have a tetrahedron that looks like this:

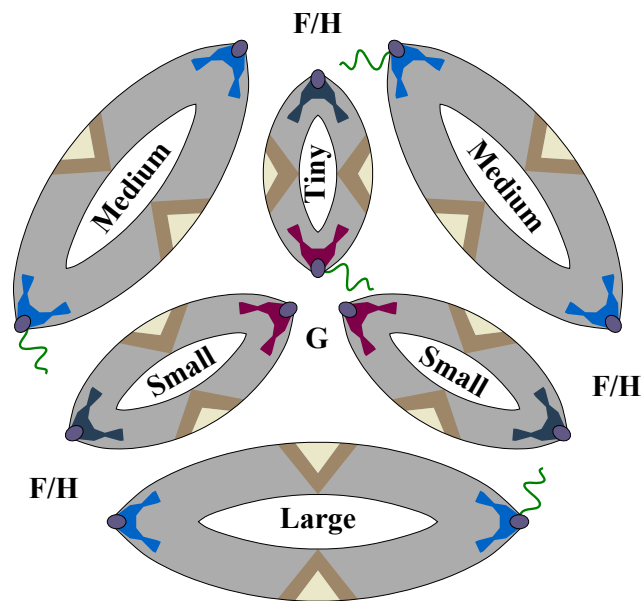


Tetrahedron Pattern 2

Make 5.

This tetrahedron is made in the same way as the other, but uses the pattern 2 ovals, which are dark grey on the edges instead of light grey.

The process is exactly the same as before, and you start by laying out the six pattern 2 ovals in the same pattern as shown below:

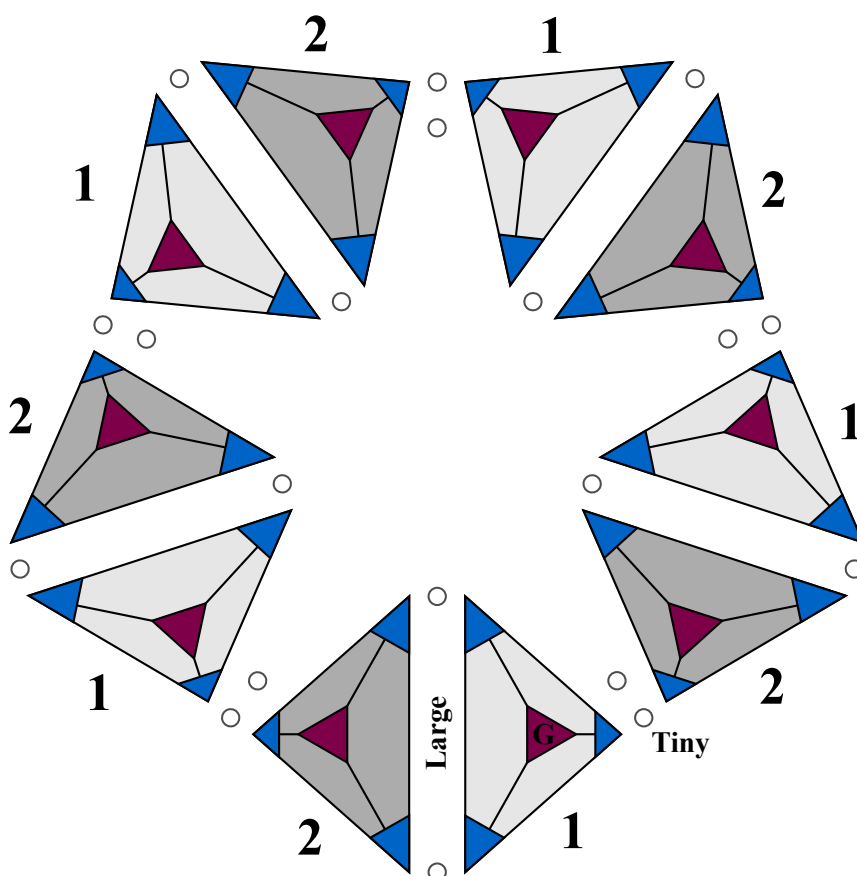


The finished tetrahedron should look like this:



Joining the tetrahedra together

Lay the tetrahedra out in a ring in the pattern shown below, alternating pattern 1 and pattern 2, and with all the red (G) vertices pointing upwards and all the **tiny** ovals pointing towards the outside of the ring.



The tetrahedrons will be joined together in this order with jump rings threaded through pairs of the size 8 beads. The joins will be alternately between pairs of **tiny** ovals and between pairs of **large** ovals, as shown above.

To join a pair of ovals, thread an open jump ring through the pair of point beads at one end of the ovals and then close it. The joined point beads should look like this:



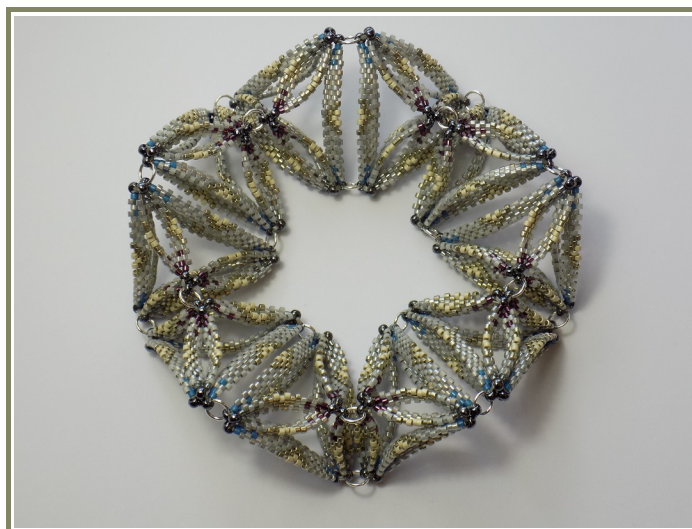
You then need to add a jump ring at the other end of the pair of ovals in the same way. The finished joins should look like this:



These joins create the hinges of the kaleidocycle. With the tetrahedra laid out as shown in the diagram the **large** oval hinges will be horizontal and the **tiny** oval hinges will be vertical:



Work around the ring joining one tetrahedron to another until you have made all ten hinges. The kaleidocycle is then complete!



Happy Beading!