Transform and Pathfinder Effects

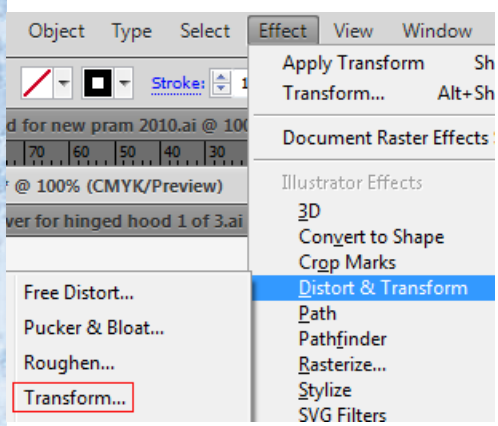
Transform and Pathfinder provide Step-and-Repeat type and weld or subtract type functions. They're simple to use and I'm just going to outline some of the basic functions that scrapbookers, etc, would use them for. So, if you want scallops, not dollops, and regularly spaced elements, not budged and fudged, this is the tutorial for you.

MAKING A SCALLOPED ROUND

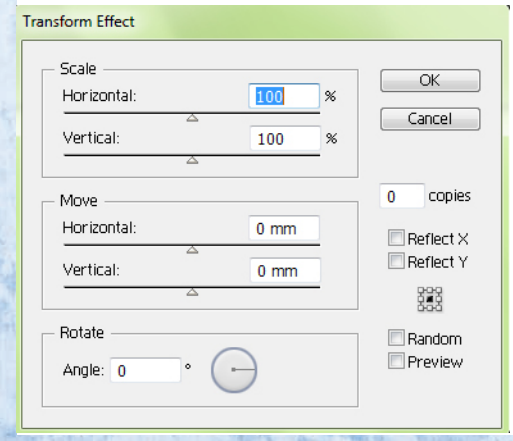
Use the Ellipse tool to make a circle.You will need to note its size. Mine, in the screen grab below is 8mm:

8mm circle

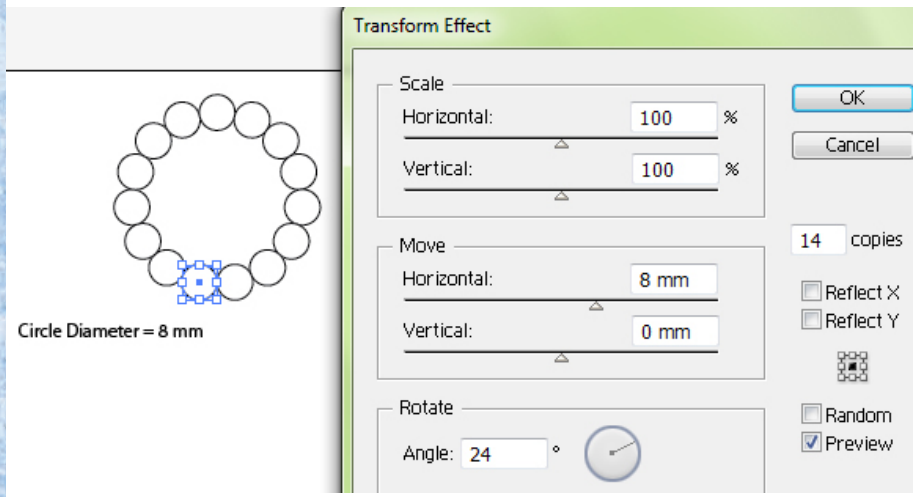
Go to Effect>Distort & Transform>Transform



The Transform Effect dialogue box will display:



You need to decide how many circles you want in your ring of circles.



I wanted 15 circles so with one already created, I needed 14 copies. The circle has an 8mm diameter so if you want the circles to touch but not overlap or have space between them enter 8mm in the Move Horizontal field.

A circle has 360 degrees so to make a perfect circle you need to enter the angle that each circle will be assigned in its orbit. Simply divide 360 by the number of copies plus the original one (15). In the case above it is:

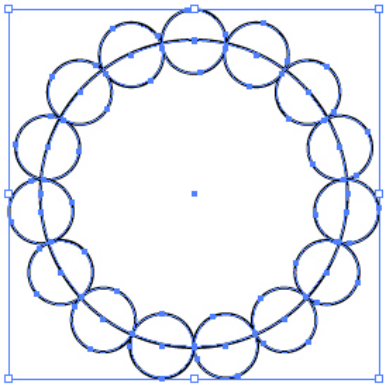
360 / 15 = 24 degrees.

With Preview on you can see it has produced the perfect circle we wanted.

Now to consolidate it into a single path.

Go to Object>Expand Appearance. This will leave the ring of circles grouped, by the way.

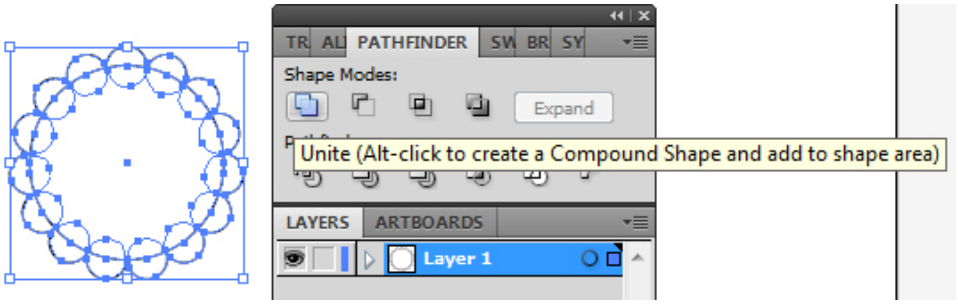
Create another circle with the Ellipse tool. Make it large enough to fill the middle of the ring and cover the inner path of the circles. The picture below will make this clearer.



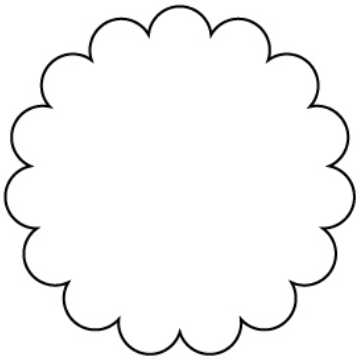
Select the grouped circles and the new circle.

Centre them horizontally and vertically using the align controls.

Go to Pathfinder and select Add:

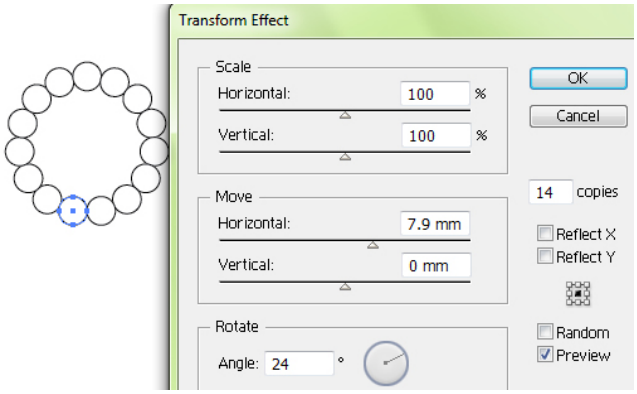


You end up with a scallop. If you have a Craft Cutting machine like a Craft Robo, you can then go to Cutting Master in Illustrator and cut the shape out.



SCALLOPS: METHOD 2

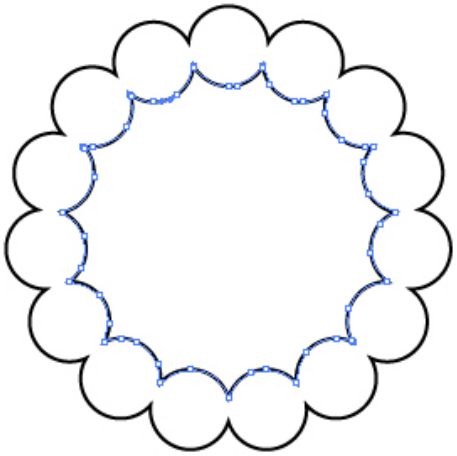
Another way of doing it would be to make the horizontal distance between the circles slightly smaller than 8mm (or whatever the size of your circles):



The circles are still 8mm but the horizontal distance is now 7.9.

This is close enough to not distort the circles visibly but provide a tiny overlap to enable Pathfinder to add them together as a single entity.

Go to Object > Expand Appearance then Pathfinder>Add.



Use the Direct Selection tool (the white arrow) to select the inner path and delete it. You will be left with as-near-as-dammit perfect scallop.

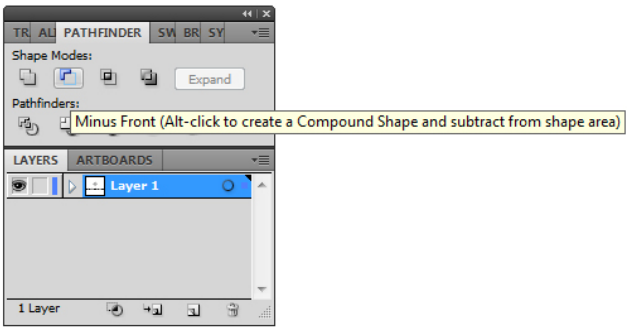
ADDING MORE ELEMENTS

This simple technique can be extended to include other elements. Let's say you want a scallop with circles cut out of each of the rounds.

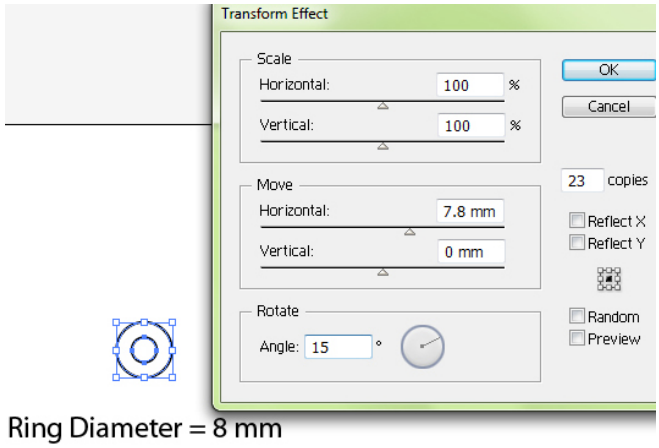
Make your circle, then make another smaller one. Position the smaller one inside the larger one and arrange them concentrically by using the Align tools to centre horizontally and vertically.

Select both and go to Pathfinder>Subtract. (If you get a message saying Illustrator cannot perform this function go to Object>Arrange and send the larger circle to the back then try again). Now you have a ring. The reason for subtracting, rather than grouping, is that should you need to add this shape to another one later, Pathfinder won't add in the smaller circle and wipe it out!

Ring Diameter = 8 mm

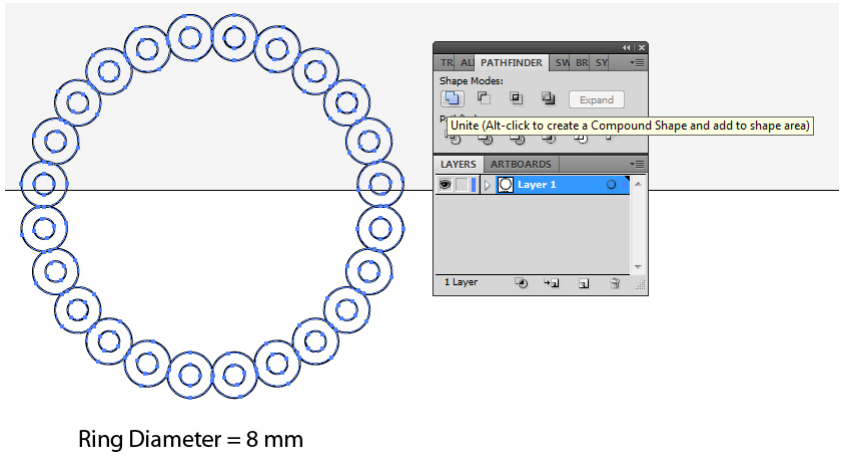


Do the same as before: Select it and go to Effect>Distort & Transform>Transform.



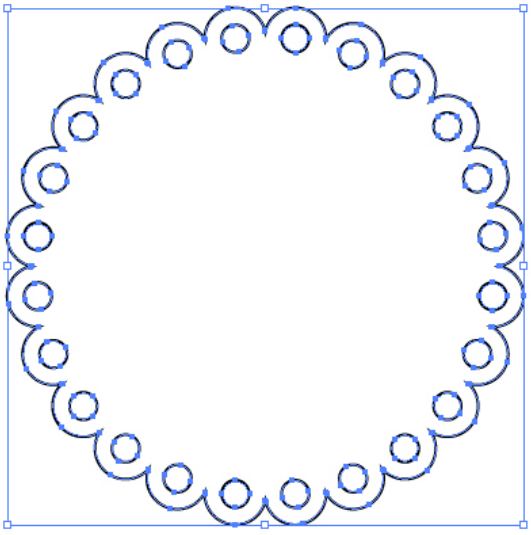
I have opted for the overlap method again here.

Go to Object>Expand Appearance then Pathfinder>Add:



Then, use the Direct Selection tool to select and delete the inner path to give you a pretty scallop with circles cut out from the rounds. This is now ready to be cut out by your Crafty Robot using Cutting Master in Illustrator.

Ring Diameter = 8 mm



But there's no need to stop there!

Let's make the shape a little more involved. Let's add a pretty dart to add more interest. The beauty of this method is that things are aligned precisely without cludgy bits that don't quite fit and mar the symmetry of repeating elements.

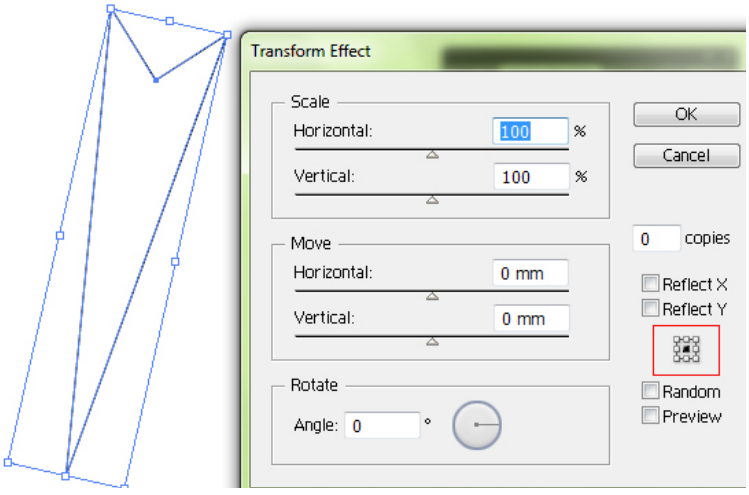
ADDING DARTS

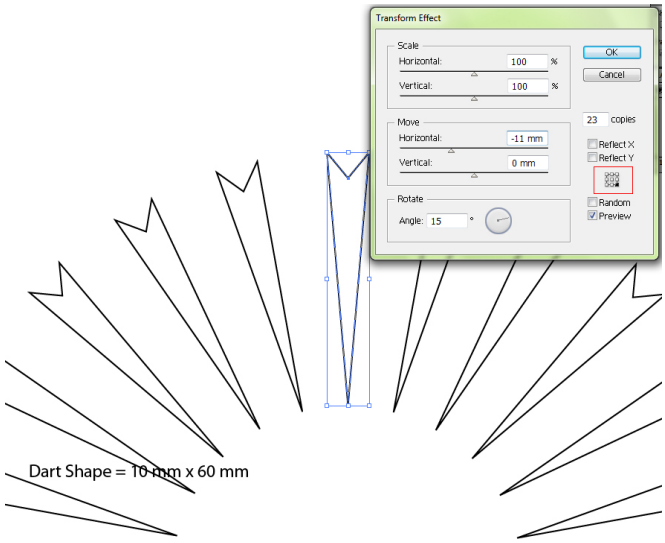
Dart Shape = 10 mm x 60 mm

Here is a standard dart shape. Before we add this to other elements, a word about the position grid in the Transform control dialogue box.

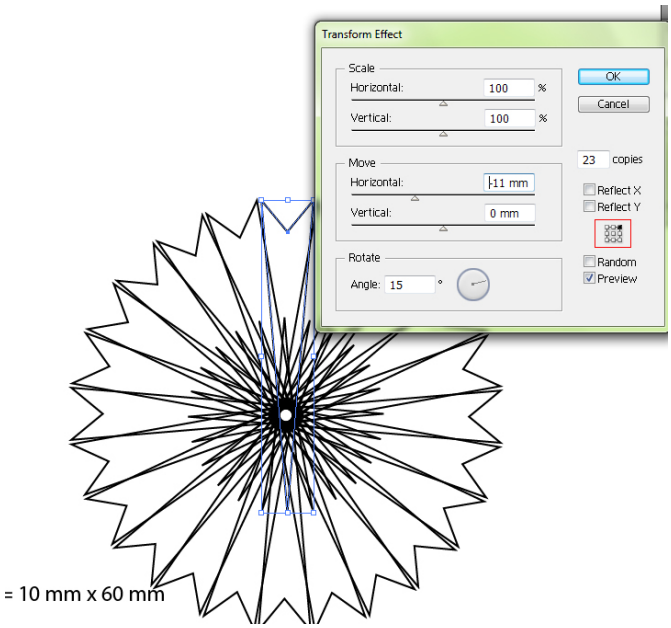
When you are creating multiple copies of objects with radial symmetry, the grid position doesn't normally matter. They will remain as a circle - the circle may move around the screen a bit but you can move it later. In the case of non-symmetrical objects, the grid position affects the way that the elements are rotated.

The first thing to remember is to ensure the shape, when selected, has a bounding box that is straight - as in it is at right angles to a straight horizontal line or vertical line to offer as much lateral symmetry as possible. The Transform controls grid sort of mirror the handles on the bounding box to dictate what is rotated about which point:

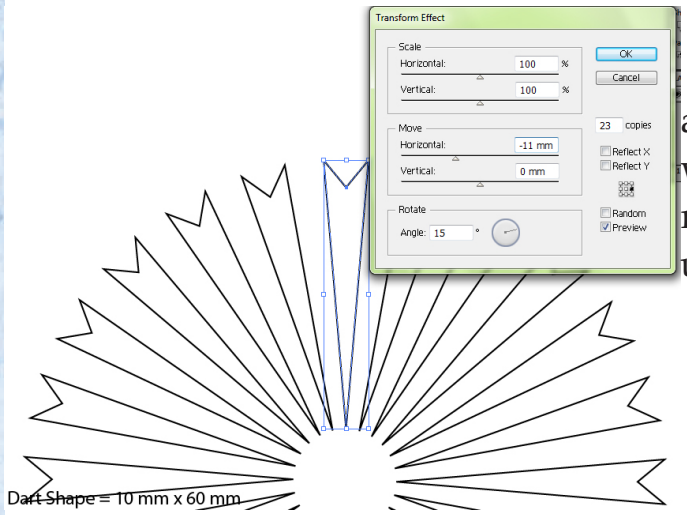




In the picture below, the dart has been copied and rotated to the bottom right handle on its bounding box:

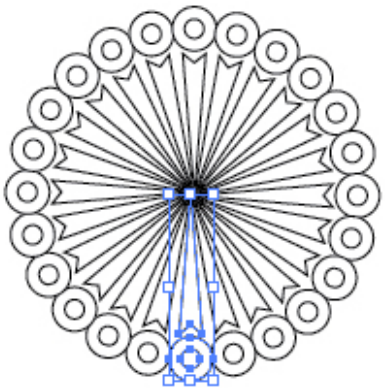


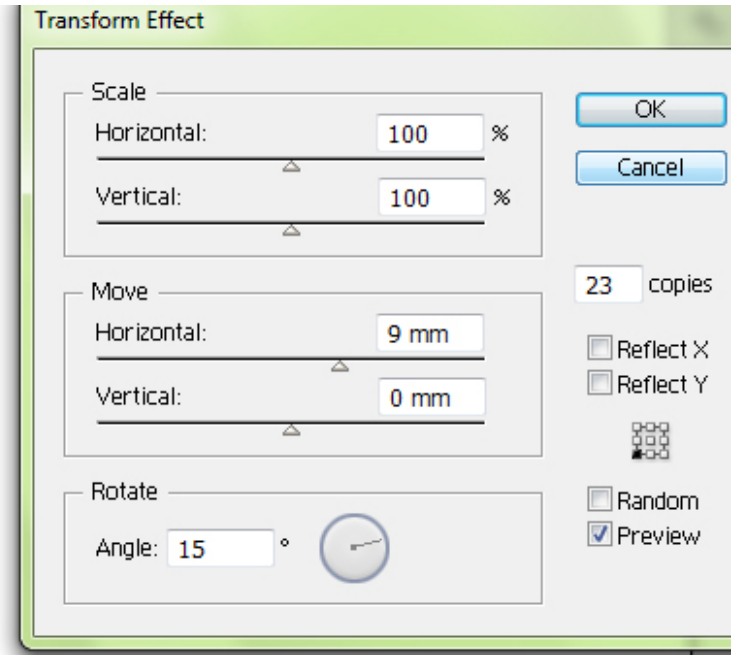
If top right grid position is clicked then effect is to tighten the grouping.



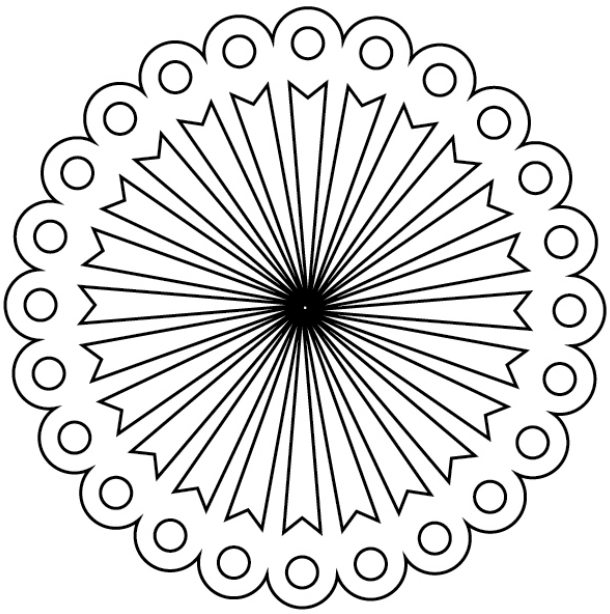
Here, middle right is selected. It's not always easy to predict how the elements will finally rotate so some shapes may require trying out each of the grid positions until you are happy with the result.

Now let's put all of the elements together and make a pretty circle:



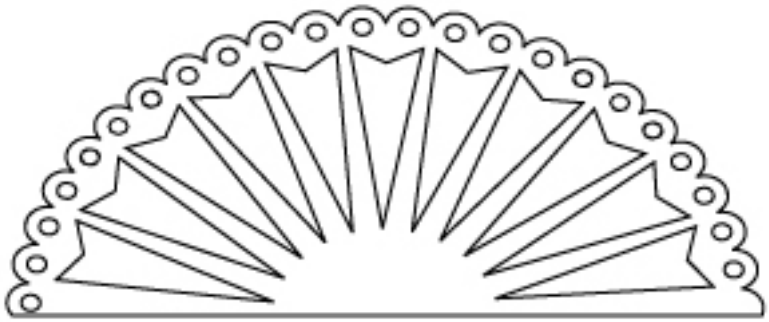


Us e the Direct Selection tool to remove the inner path of the circles and we have a lovely round shape that can be cut out with Cutting Master software in Illustrator.



This shape can be resized or cropped using the Pathfinder>Subtract tool to suit your project.

The circle was cut in half to give this pretty semi-circle:

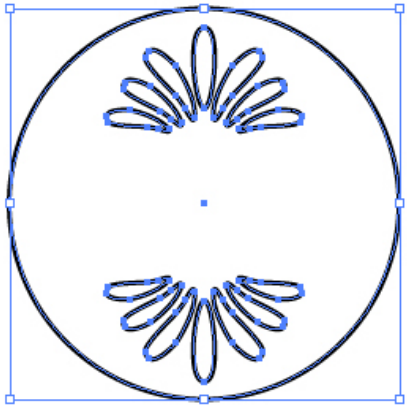


And, of course, you can use these techniques to make all sorts of other pretty shapes like this scalloped border, for example:

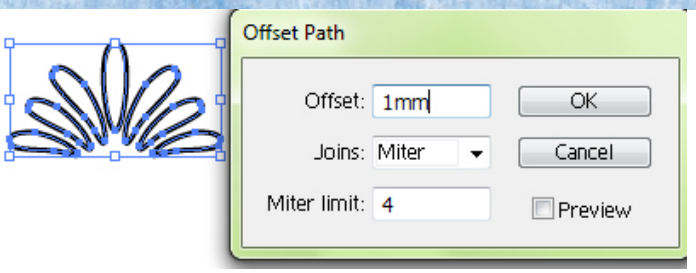
Other shapes do not lend themselves so well to the Transform effect filter. They may need to be individually repeated and rotated and for that you need the Transform Each functions. Access these controls using Alt-Ctrl-Shift-D.

Let's take the shape of the Fiskar's Sunburst Border Punch. I love this tool and use it to edge things nicely when setting up the Crafty Robot would be overkill when this gadget will do the job in seconds.

I have reproduced the effect here and reflected it horizontally to make a pretty shape that can be cut out of another. But what if you want the shape to add to an existing shape? First, you need to outline it.



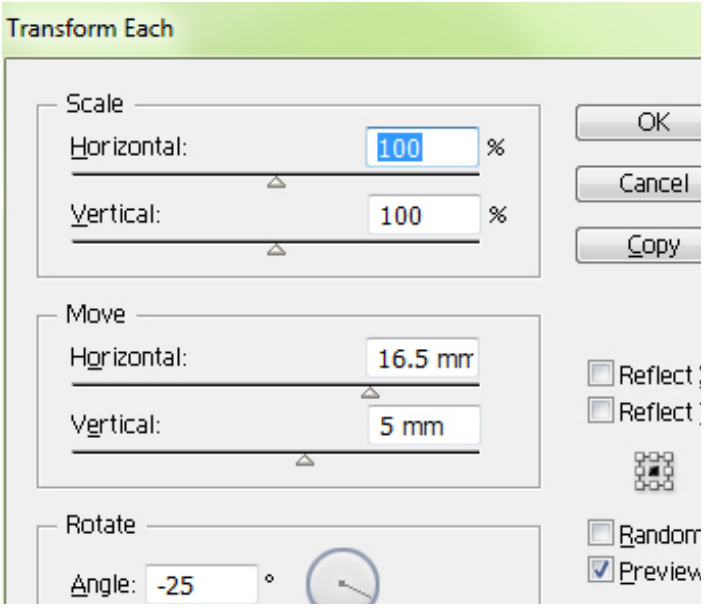
Go to Object>Path>Outline Path and enter a value of say, 1 mm. There is always some trial and error to achieve the effect you're looking for but it's quick and easy with the preview on.



After Expanding, etc, this produced:

Use the Pathfinder>Subtract function to give you a shape that can be added to other shapes and retain the cutouts within it.

Now, like I said earlier, the Transform Each is a perfect tool to duplicate and then rotate individual elements:



My shape is 16.5mm wide so I select Move Horizontal and enter 16.5mm.

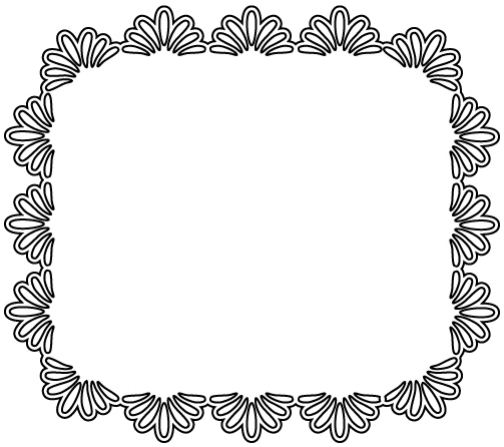
You can enter a negative '-' sign before the 16.5 mm to create a duplicate the the left of your original shape. Positive integers produce movement to the right on the x axis. Similarly, you can enter a '-' value in the Vertical field to duplicate the element above the original, ie, the y axis.

Scaling will produce a series of elements of successive larger or smaller sizes depending on the values you enter and the number of times you reproduce them.

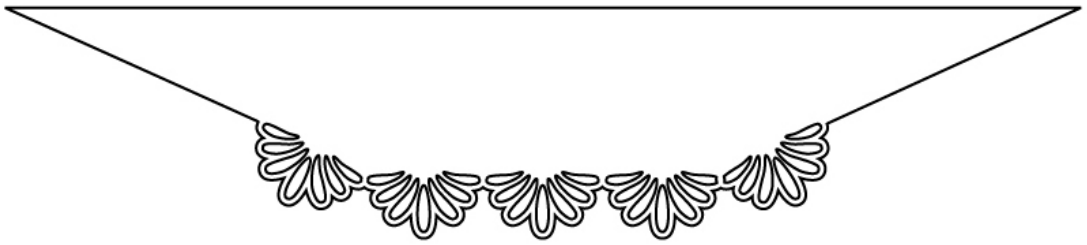
There is not an option to select the number of copies but that is not a problem as you shall see. When you are happy with the values you have entered make sure you click Copy!

From now on, simply use Ctrl-D to reproduce your element as many times as you like. Now supposing you want to turn a corner, say. Then bring up the Transform Each dialogue box again and change the angle, like so:

You could go on to make an oblong of shapes like the one below. I added a shape to combine the sunburst to and create a single compound path that can be cut using Cutting Master, for example. The beauty of this is that it is aligned and regular. No distorted odd shapes to make things fit!



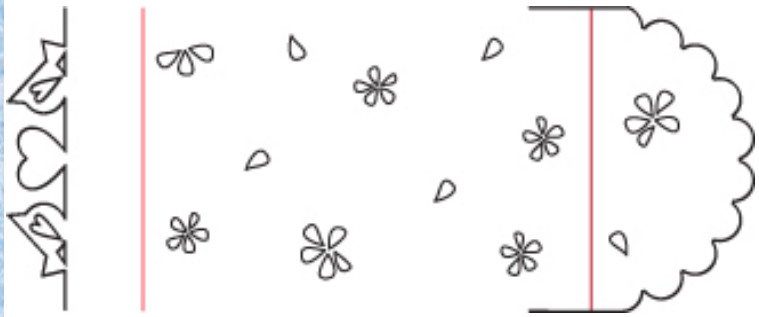
You can add the shapes to any other shape you might have a use for:



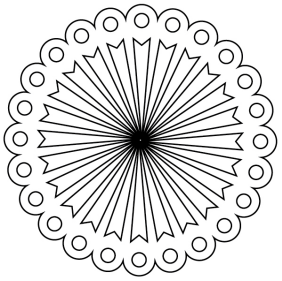
The possibilities are endless. You won't need Penne and Teller to help you reveal the

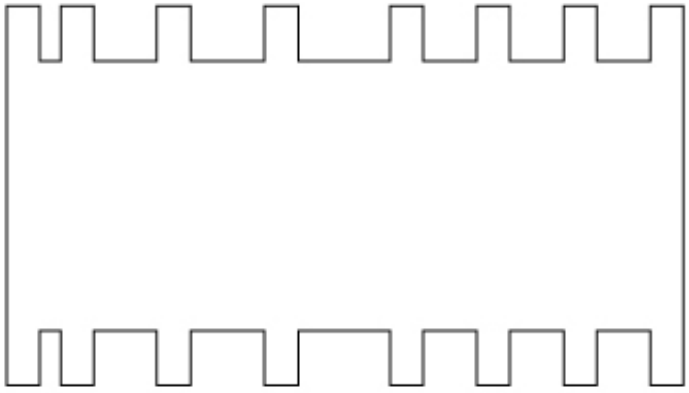
'secrets' to deconstruct and build your own patterns and models.

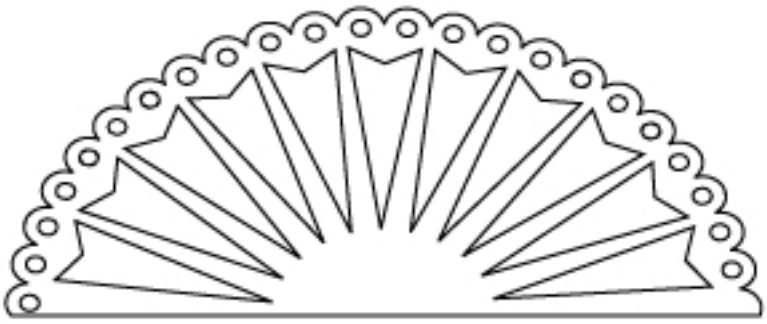
You've probably come across all sorts of patterns, hand drawn ones, even, on craft sites that you could dress up with some frilly scallops etc. You've seen the pram I made on this site. It can easily be amended in all sorts of ways. I have used the techniques outlined here today with a small amount of tweaking to produce these shapes:

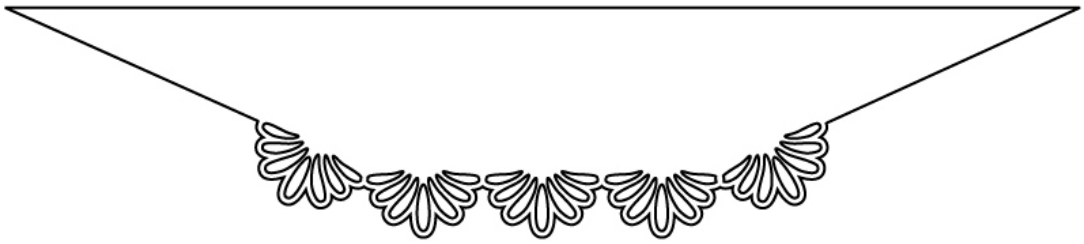


The red lines are fold lines, btw.

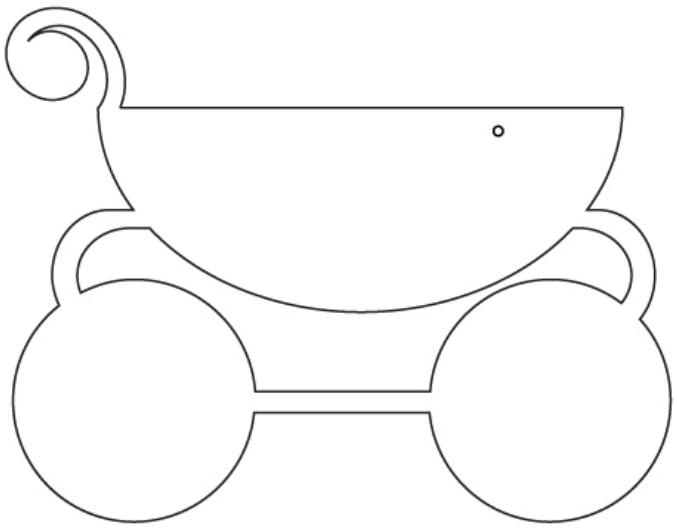








This shape is based on an actual pram photograph! It's simplicity itself. If you cut two of these shapes out (mirrored) you can join them to the strange rectangle with the jutting out bits to form a simple pram.



All you need then is a bit of window dressing - add the chintz and frou frou and pretty it up!

Templates really are easy to create.

Enjoy.