

# Making a Hexatessellation

## Requirements:

- Constructed regular hexagon (make or use a pre-made file)
- Previous experience with The Geometer's Sketchpad, e.g. "Rotated Tessellation" sketch

1. Starting at one vertex of a regular hexagon, make a curving series of points that go toward an adjacent vertex;

2. Select all of these points;

3. Construct segments to join them in a wave-like shape.

4. Select the wavy line and all the points along it;

5. Mark a center of rotation at either end;

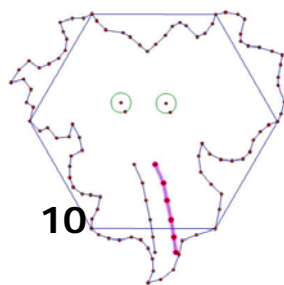
6. Rotate the wavy line;

7. Its end should match up with the next vertex.

8. Repeat steps 1 through 7 for the next two sides;

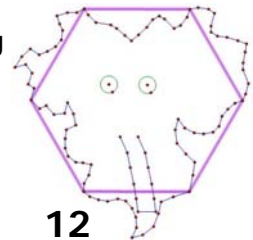
9. Repeat steps 1 through 7 for the final two sides.

10. The completed shape reminded me of an elephant, so I added two circles for eyes and drew in a trunk.
11. A translation was used to do the right side of the trunk once I'd made the left side.



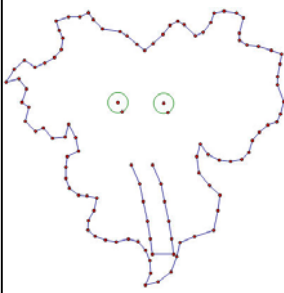
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12. Ensure everything is de-selected, then select only the sides of the original hexagon;
13. Hide the hexagon (CTRL + H).

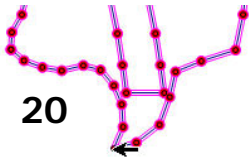
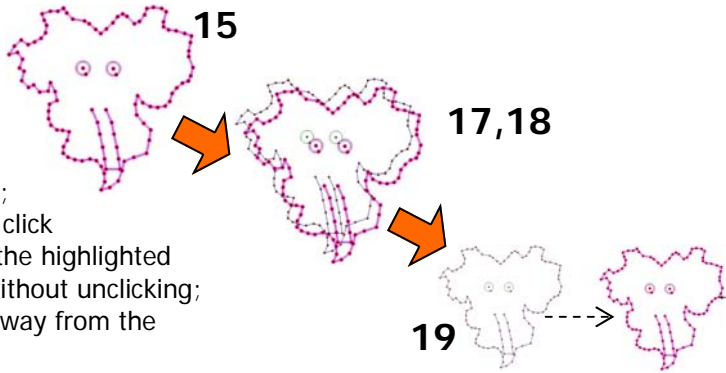


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14. You now have this:

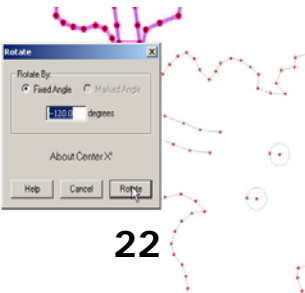


15. Select all;
16. Copy;
17. Paste (the pasted copy will overlap the original);
18. CAREFULLY click any part of the highlighted copy and, without unclicking;
19. Drag it far away from the original.



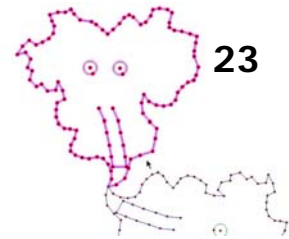
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20. Pick a point anywhere on the copy and mark it as a center of rotation (here the tip of the "trunk" was chosen because it will fit into the "notch" below the elephant's right eye);



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21. Transform > Rotate;
22. Enter -120 degrees (in this this example; you might have to experiment if you have used a different design) - you will see a "shadow" of what the rotation will look like: if that is OK, click "Rotate."



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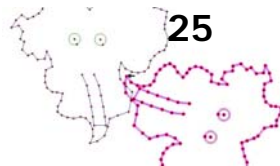
23. Select all of the non-rotated shape except for the point used for the rotation;

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24. Hide this shape; leave the rotated copy highlighted for the next step.

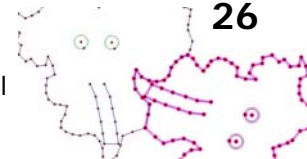


25. Click on the rotated design and drag close to where it fits (here, the tip of the trunk fits into the notch below the eye).



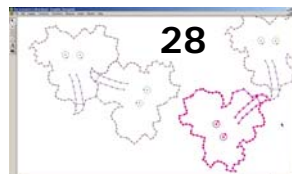
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26. Use the arrow keys on the keyboard to nudge the shape until it fits perfectly into the original.



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27. Edit > Paste (or CTRL+V) will repeat step 17 without having to copy;
28. Repeat steps 18 through 26 with this second copy (move the copy, rotate it, hide its original, move the rotated copy);
29. Use the arrow keys on the keyboard to nudge this copy into place.



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The finished hexatessellation!

