

TESSELLATION PROJECT DIRECTIONS

Name: _____

You are to create your own tessellation masterpiece. Your tessellation will be created based on specific criteria. You **MUST** follow the guidelines given in order to receive full credit. The tessellation will be constructed on white paper. Your grade will be based on the following:

Tessellation Creation:

| | |
|--|------|
| Pattern Tessellates the plane | (4) |
| Template with modifications turned in | (4) |
| Appearance and Neatness | (4) |
| <u>Creativity/Originality/Difficulty</u> | (4) |
| Total Points | (16) |

Create your own Tessellation

The appearance of your tessellation should be neat! Your tessellation (pattern) should cover the ENTIRE page (no gaps or unintentional white spaces). You are to turn in the template figure you used to create your tessellation. Coloring should be in between the lines, and no wrinkled or torn projects! Your project will also be based on creativity and difficulty. The more creative and complex the tessellation is, the higher your grade will be. You may not simply take a polygon and slide, rotate, or reflect it over and over again to create your tessellation. You **must** use a figure created using one of the nibbling methods.

What to do

1. Begin by creating a "template" using at least 1 of the nibbling methods.
2. Once the template has been created, place your template at any of the four corners of your paper and trace your first figure.
3. Once your figure has been traced slide it or reflect it and trace your next figure (whether you reflect or slide it depends on the nibbling technique you used).
4. Continue step 3 until the entire page is covered. All your figures on the paper should fit together so that it looks like a puzzle. Figures at the edge will only be partial images.
5. Once the page is covered, begin to add color to the figure.
6. Be creative and have fun with the project!

WHAT TO TURN IN

Tessellation creation with template

This project is **DUE** _____

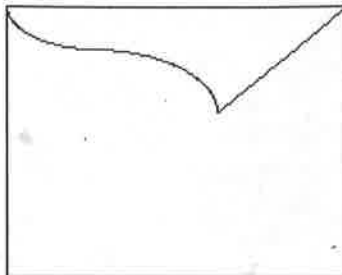
*****All late projects will have 10% deducted from the grade for each day that it is late and no project will be accepted after 1 week late. *****

CREATING YOUR TEMPLATE

METHOD 1: The nibbling technique for geometric transformations:

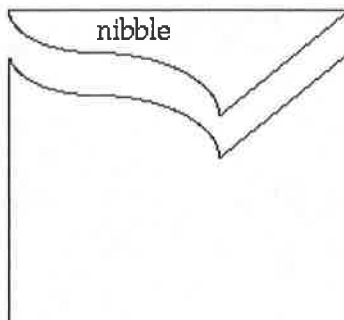
1. Begin with a square and design from one corner of the square to an adjacent corner. (Do not draw diagonally). Do not stop halfway across!

1



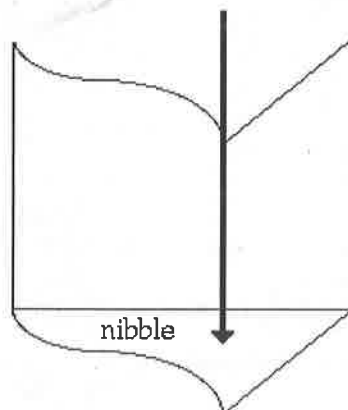
2. Cut on the design line, being sure to have 2 pieces when done -the nibble and the rest of the sheet. There should be no other pieces laying around. This is very important! No trimming allowed.

2



3. Slide the nibble across the sheet to the opposite side and tape the straight edges together. (Do not attach it to an adjacent edge. Do not flip the nibble around. Do not overlap the edges when taping.) The corners of the piece and the nibble should match perfectly.

3

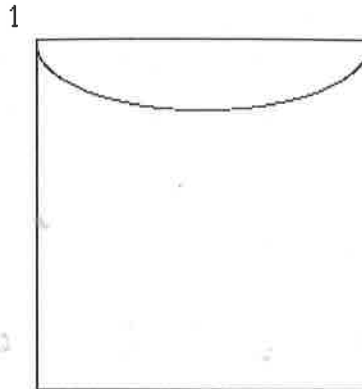


4. Repeat the procedure for the other sides.

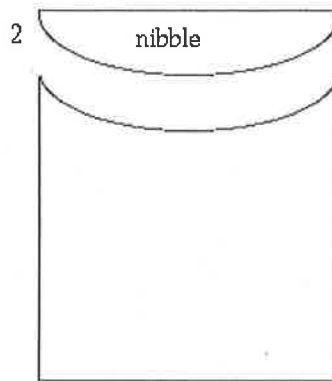
METHOD 2: The Rotating and nibbling technique for geometric transformations:

1. Begin with a rectangle and design from one corner of the rectangle to an adjacent corner. (Do not draw diagonally). Do not stop halfway across!

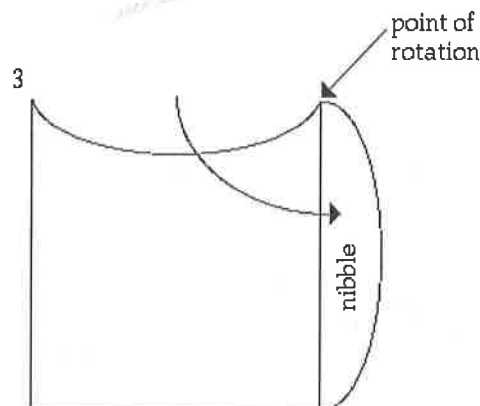
Rotation



2. Cut on the design line, being sure to have 2 pieces when done -the nibble and the rest of the sheet. There should be no other pieces lying around. **This is very important! No trimming allowed.**



3. Instead of sliding the nibble, rotate the nibble at its end point to an adjacent side of their square (not an opposite side). Mark your point of rotation and tape the straight edges together. (Do not overlap the edges when taping.) The corners of the piece and the nibble should match perfectly.

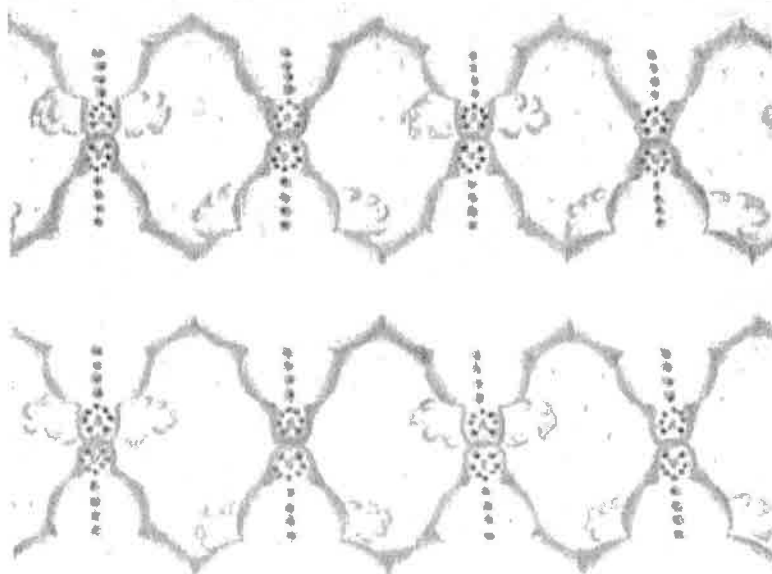


4. Repeat the procedure for the other sides.

Creating a Tessellation Using Reflections:

1. Select any figure you want to use as your pattern (can use a figure from either nibbling methods or a combination of both).
2. Reflect or "flip" the figure repeatedly vertically (over the x-axis).
3. Once you have a row of "flips", take that row and reflect it horizontally (over the y-axis)
4. Continue Steps 2 and 3 until your paper is covered.

Example:



EXAMPLES OF TEMPLATES AND THEIR TESSELLATIONS

Two specific silhouettes or illustrations of animate figures are shown below. They are examples of alterations of opposite sides of a regular grid by translations.

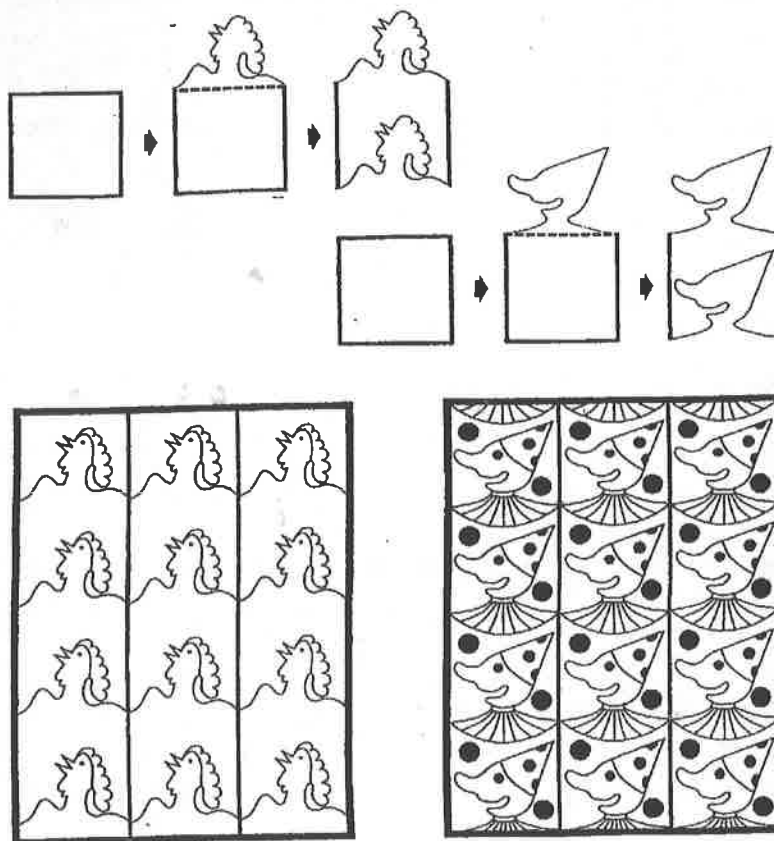
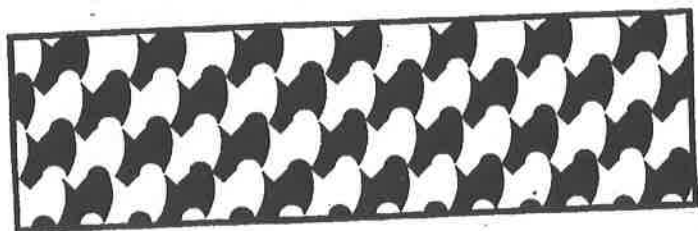
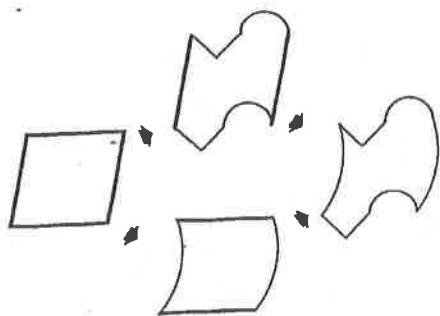


Figure 3-7

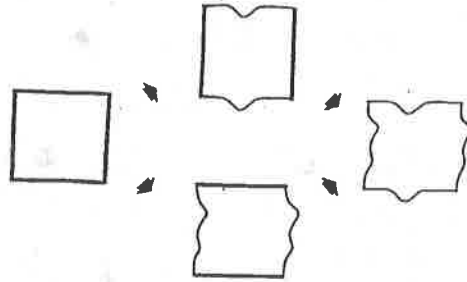
Tessellating shapes can be formed by applying the "nibbling" techniques to both pairs of parallel sides. An example is shown below.



Creating Animate Figures with Tessellations

There are two approaches to altering tessellating polygons into animate figures.

1. Have a specific object in mind and alter the original polygons (rectangle, square, or parallelogram) sides to make the shape look like the object (nibbling techniques). This approach may require a bit of trial and error.
2. Create a new shape using the nibbling techniques and then use you imagination to see what you think it "looks like". Below are two examples



Does the new shape look like anything special to you? Does it remind you of anything? There are many things it could be. It could be the head of a person wearing a feather in his cap.

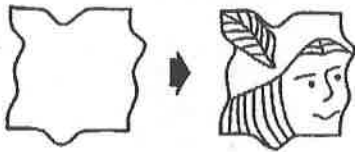
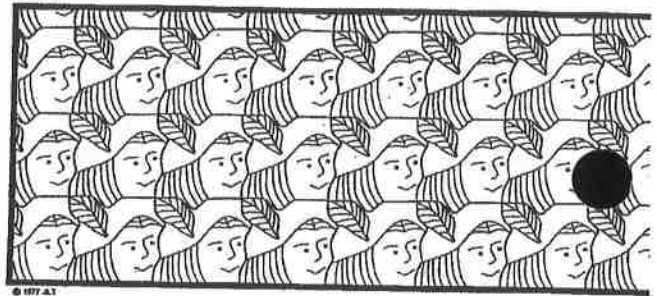


Figure 3-15

50



Here is a different altered square. What does it look like to you? Maybe a flying owl?

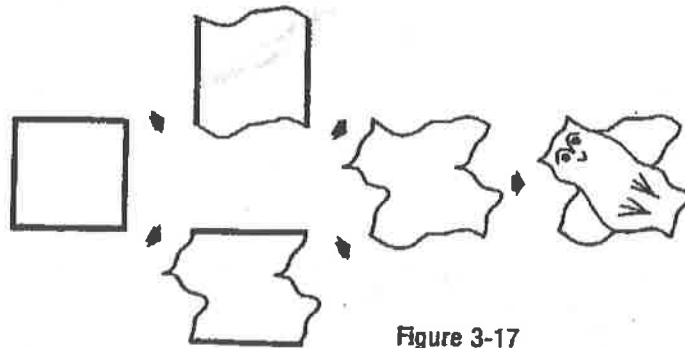


Figure 3-17