Transformations and Tessellations

Chris Wyckoff
Portfolio of Work Completed on Transformations and Tessellations

You will submit a portfolio of what you have learned from your study of transformations and tessellations. This portfolio will contain:

a. All completed activities on transformations and tessellations.
b. 3 Escher-type tessellations, colorfully illustrated on 9x12 inch oaktag.
c. A 4-5 page summary explicitly describing what you have learned about

   1) Transformations: translation, rotations, and reflections
   2) Similarities or relationships of translations, rotations, and reflection transformations
   3) Effect of transformations on order of points on an object
   4) Symmetries of polygons
   5) Tessellation of regular and non-regular polygons

d. The material in your portfolio should be carefully organized and bounded. All portfolios are due on Friday, March 18 during your class period. If you do not submit a portfolio on Friday, March 18, you will complete a letter to take home at that time telling your parents that your project was not submitted on time. Any portfolio submitted after Friday, March 18, will have one grade deducted for each day late.
e. Value of Portfolio: 1 unit test, 2 quizzes, and 8 homework assignments.
f. Evaluation of project

Activities will be graded on a scale of 0-3

0- activity not completed
1- activity shows incomplete understanding of concept
2- activity shows good understanding of concept
3- activity show exceptional understanding of concept

Summary will be graded on a scale of 0-4

0- summary not completed
1- summary shows incomplete understanding of concepts
2- summary shows good understanding of concepts
3- summary show exceptional understanding of concepts

Each Escher-type tessellations will be graded on a scale of 0-4

0- tessellation not completed
1- tessellation shows incomplete understanding of concept
2- tessellation shows good understanding of concept
3- tessellation show exceptional understanding of concept
Tessellations And Transformations

By Chris Wyckoff
In this chapter, I learned a variety of things from transformations to tessellations. I learned a lot in this section, so I'll begin with transformations and the different types of transformations. A transformation occurs when each point of a plane figure is paired with exactly one point of its image on the plane, and each point of the image is paired with exactly one point of the original figure. There are three types of transformations: translation, rotation, and reflection. Let's start with a translation. A translation is the simplest form of transformation.

If you were to draw a figure on a piece of paper and then slide the paper along a straight path, each point of the figure will move the same direction and distance. Let's now move along to a rotation transformation.

If you draw a figure on a piece of paper and place your pencil point one any point of the figure, then rotate the figure around the point, the turn motion models a rotation.

When doing a rotation, the corresponding points will not go in the same direction or the same distance, like they do in a translation transformation.

If you trace an angle with the center of rotation at its vertex; one ray passing through a point in the original shape, and the other ray passing through the corresponding point in the rotated image. The angle will be the same between each corresponding point. We now come to reflection transformation. If you draw a figure on a piece of paper, place the edge of a mirror on your paper, and look at the figure in the mirror, you will see the figure reflected. A line of reflection defines a reflection. For examples see Transformations and Tessellations on page 297.

Well that's all for transformations let's now move along to tessellations. Tessellations have three different types: translation, rotation, and reflection. To do a translation tessellation is like a translation transformation. To create a
Translation Tessellation. You must take a piece of square grid dot paper, select a square, and draw a curved line from one vertex to an adjacent vertex. Trace the four vertices of the square and the curve on patty paper. Slide the patty paper and trace the curve on the opposite side of the square. Draw a different curve on the square grid and slide the patty paper and trace the grid curve on the opposite side of the square. Then study the shape, use your imagination, and fill in some details. Next is a rotation tessellation. To do a rotation tessellation, select a square on a piece of square dot grid paper and draw a curve from one vertex to an adjacent vertex. Trace the four vertices and the curve onto patty paper. Choose one of the vertices to be the endpoint. Rotate the patty paper 90° around that point. Draw a different curve on the dot paper and rotate 90° on an endpoint. Draw in details and you have formed a rotation tessellation. Now move along to a reflection tessellation. To do this, you take a piece of rectangle grid dot paper, select a rectangle and draw a curve from one point to an adjacent point. Trace this to a piece of patty paper, translate this curve to the left or right. One dot paper, draw a new curve at the top of the rectangle and copy this to the patty paper, slide the patty paper. Now flip the patty paper over line of reflection and align the vertices. Then trace the curve. Add details and you have now done a reflection tessellation.

What you have just read is a summary of what I learned and how to do the things in this last section.
EVALUATION OF TRANSFORMATION AND TESSELLATION UNIT

| Activity 9.1  | 3 (0-3)  | Summary  | 3 (0-3)  |
| Activity 9.2  | 3 (0-3)  |          |          |
| Activity 9.3  | 3 (0-3)  | Tessellation (1) | 3 (0-3) |
| Activity 9.4  | 3 (0-3)  | Tessellation (2) | 3 (0-3) |
| Activity 9.5  | 2 (0-3)  | Tessellation (3) | 3 (0-3) |
| Activity 9.6  | 3 (0-3)  | Tessellation Total | 9 (0-9) |
| Activity 9A   | 2 (0-3)  |          |          |
| Activity 10.1 | 3 (0-3)  |          |          |
| Activity 10.2 | 3 (0-3)  |          |          |
| Activity 10.3 | 3 (0-3)  |          |          |
| Activity 10.4 | 3 (0-3)  |          |          |
| Activity 10.5 | 3 (0-3)  |          |          |
| Activity 10.6 | 3 (0-3)  |          |          |
| Activity 10.7 | 3 (0-3)  |          |          |
| Total Activity| 41 (0-42)|          |          |

Final Grade

Activities: 98 x 2 = 196 20%
Summary: 100 x 4 = 400 40%
Tessellations: 100 x 4 = 400 40%
Unit Grade: 99.6 100%

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Evaluation of Activities, Summary, and Escher-type tessellations

0 - No activity, summary or tessellation turned in or completed incorrectly.
1 - Activity, summary, or tessellation shows incomplete understanding of concepts.
2 - Activity, summary, or tessellation shows a good understanding of concepts involved.
3 - Activity, summary, or tessellation shows a thorough understanding of concepts involved.

Activities: A: 38-42; B: 27-37; C: 16-26; D: 11-15; F: 0-10
Summary: A: 3; B: 2; C: 1; F: 0
Tessellations: A: 8-9; B: 5-7; C: 3-4; D: 2; F: 0-1