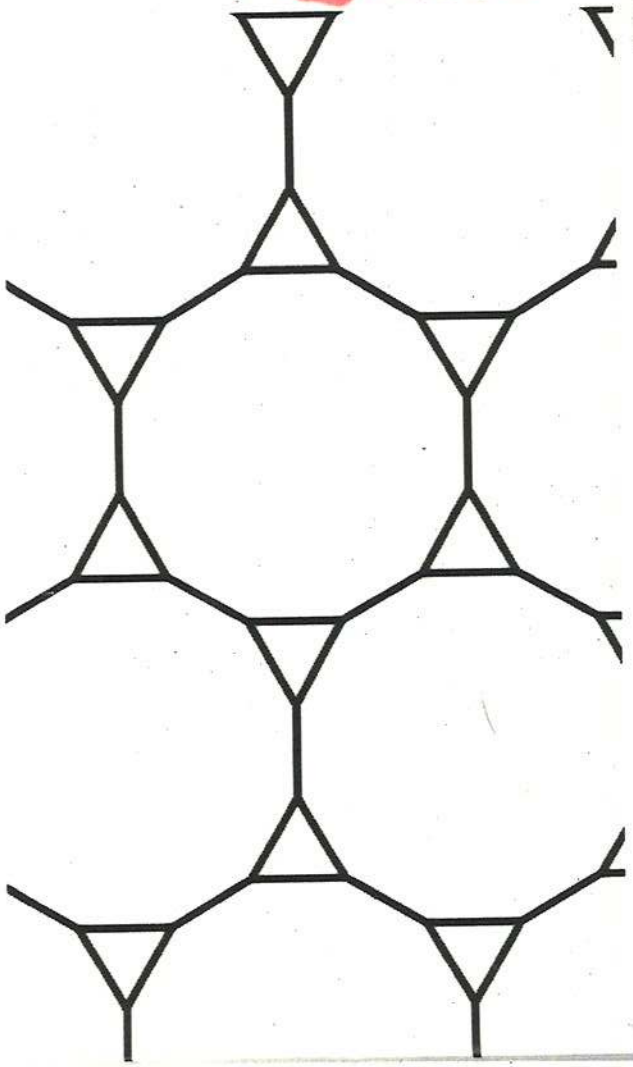
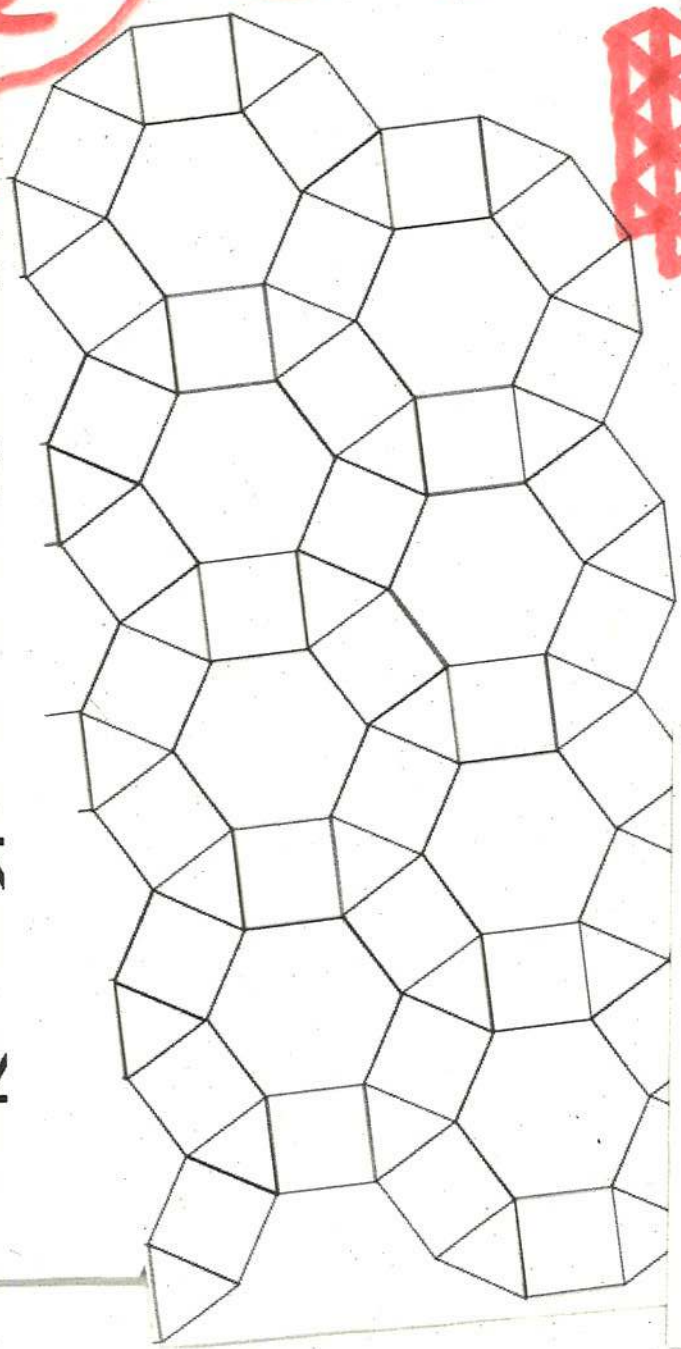
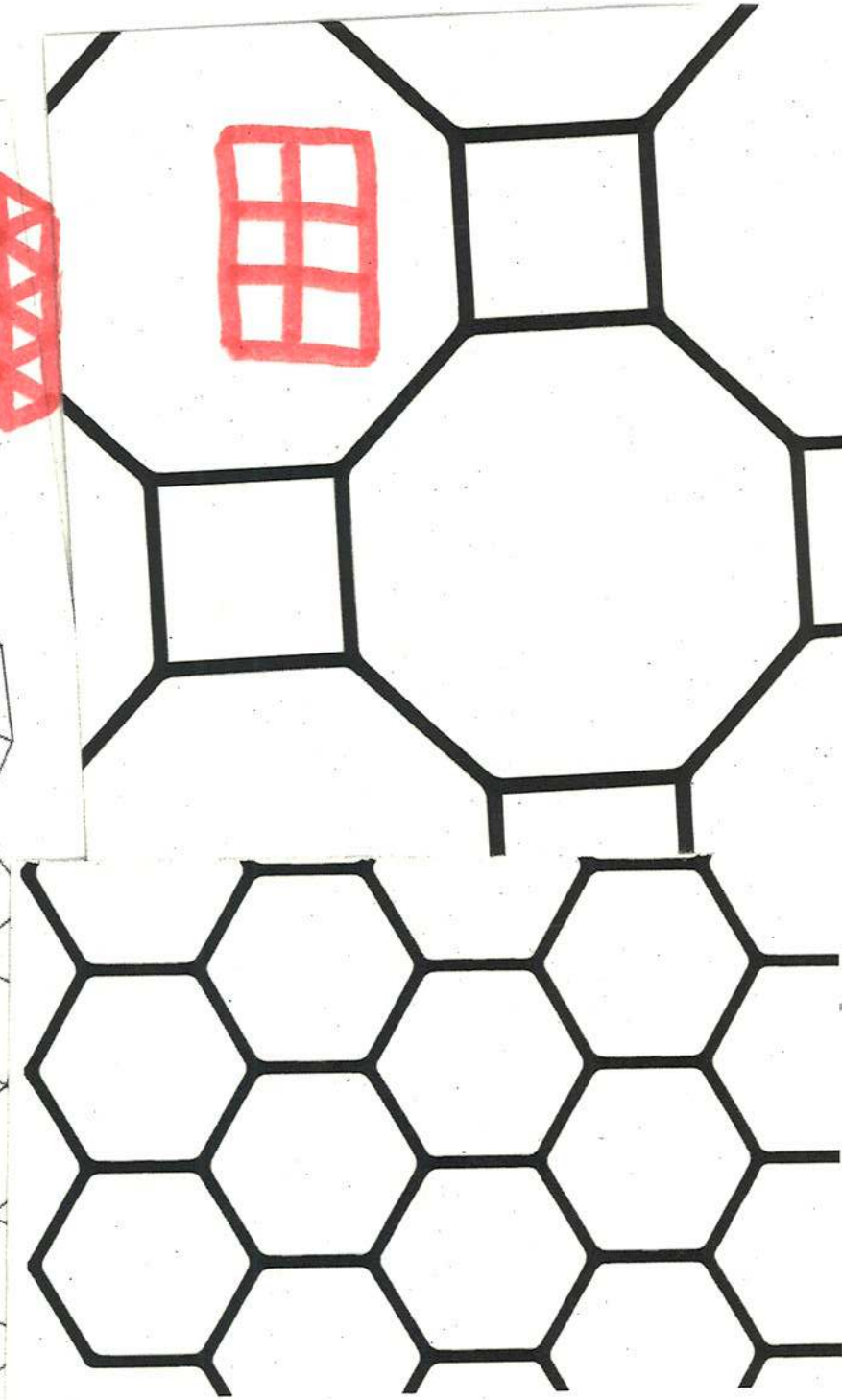
Regular Tessellations of the Plane

Investigation







Grade 8 Math Investigation: Regular Tessellations of the Plane

In this activity, you are going to investigate regular tessellations of the plane, which is a tiling of the plane that leaves no spaces, repeats itself and uses polygons all of whose sides have the same length. The goal is to find out the conditions under which such a tessellation exists, and to predict the type and number of these tessellations. To conclude, you will do some research to find out where these tilings occur in the world around you.

Part 1: Numeracy Activity

Using the numbers 60, 90, 108, 120, 135, 150, find all the possible ways to build a sum of 360. You are allowed to use numbers more than once.

Part 2: Geometry Connection to Polygons

A regular polygon is a closed figure with n equal sides, like a square, pentagon, equilateral triangle etc.

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The size of one angle in a regular n sided polygon is given by (n-2)x180/n

Challenge: Explain why this is the correct formula

Complete the following table:

Number of sides	Name of Polygon	Size of one interior angle
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Part 3: Connecting Numeracy to Geometry

Answer the following questions to help predict the type and number of regular tessellations of the plane that could exist.

1. In part 1 of the activity, what is the significance of 360 in creating tessellations?
2. How do the sums you created in part 1 link to tessellations of the plane?
3. Which of your sums in part 1 link to the tessellations on the cover of your investigation?
4. Why can't a tessellation contain more than 6 polygons that meet in a point?
5. Why must there be at least 3 polygons in a tessellation that meet in a point?
6. Why can't a tessellation contain more than one 10 sided figure?
7. Why can't a tessellation contain a 7 sided figure?

Part 4: Designing Tessellations

Using a geometry software or shapes on a Text document, draw the different types of tessellations that exist.

Using internet resources, find real life situations in which tessellations are used. These could be in architecture, nature, art, biology,....