# Tessellations in the Lower Grades

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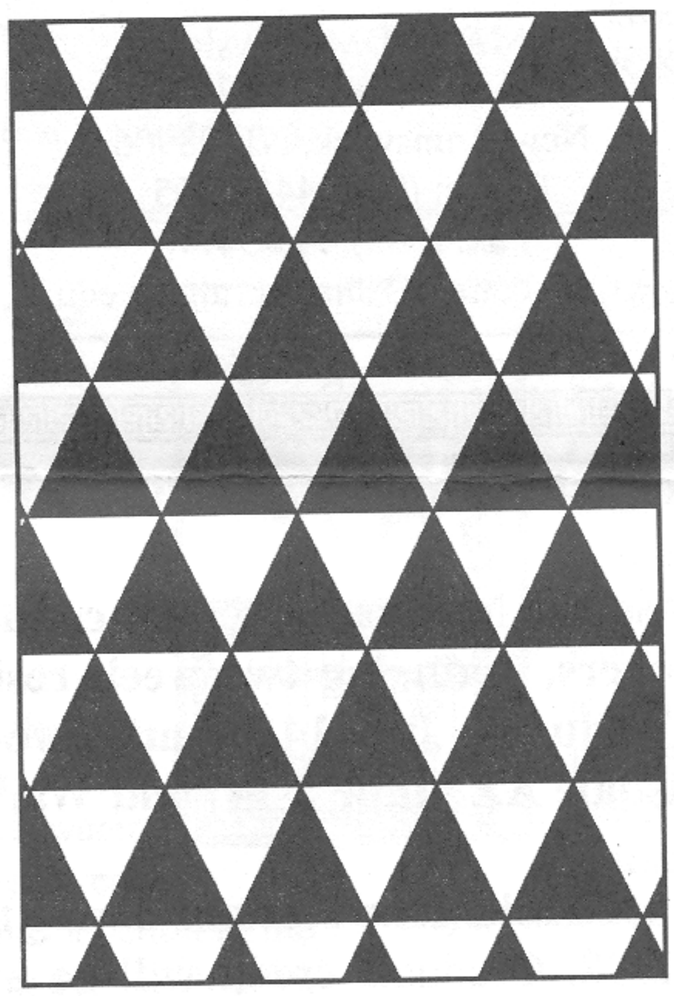
Tessellations seem to be very popular among intermediate and junior high school students. It might then be assumed that this concept would be too advanced or too abstract for students in the primary grades. This, however, was not the case with my Kindergarten class. Tessellations have in fact become one of their favorite topics. It appears that when approached at its very basic level, tessellations can be easily recognized and understood by primary students.

My class is comprised of 34 Kindergarten students in a self-contained full day setting. It is neither the size nor structure of the class which sets the tone for this experience, but inevitably the individual interest of each student. What was accomplished with this group could, I believe, be accomplished with a number of groups of various sizes and settings.

While reviewing basic shapes, my Kindergarten class began to experiment to see if certain shapes could be placed next to each other in a manner that would neither cause them to overlap nor leave spaces. When such a shape was discovered, it was then added to a list which we were compiling. As the list expanded, we discussed what these shapes all had in common. The responses included the fact that each shape was made up of sides and corners. Others pointed out that the shapes were straight and did not curve as did the circle which was not included on this list.



After all the basic shapes which did not overlap or leave spaces were identified, the word "tessellate" was introduced to the class. The word—because of its size and sound—intrigued the children. The class was separated into groups of four or five and given pattern blocks of the same shape to tessellate. These blocks also became useful as tracers. The children were able to pick their own shape and make an illustration using the block as a pattern to trace.

One of the things which the students found most exciting was the search for tessellations in their own home and school environments. They discovered that the tiled ceilings and floors of the classrooms were tessellations, as were the brick and cinder block walls. They also explored their own homes and reported that such things as kitchen floors, checkerboards, tablecloths and fences were tessellations as well.

These discoveries at the class level allowed us to discuss how most tessellations exhibited a pattern involving either color or shape. The checkerboard, for example, was a wonderful representation of a tessellation organized in a color pattern. The students were then able to take their own tessellations of squares and color them in a pattern of their own. The class was also able to recognize at a very simple level, that a tessellation of triangles involved the rotation or change of position of every other triangle. We identified this as a pattern and used it in the creation of Native American headbands for our Thanksgiving feast.

Motor skills at the Kindergarten level vary quite distinctly from student to student so that creating and tracing their own individual tessellations would be too frustrating for children at this developmental level. It is very rewarding, however, to see these children begin to understand the mechanics of a tessellation and recognize basic shapes in a tessellated form. Using pre-cut shapes, the class was also able to work together to form one large class tessellation. it was quite a demonstration of cooperation. In addition, the challenge in creating this one large tessellation was that the completed tessellation should follow a color pattern.

Paper folding is an additional method we used to illustrate the tessellation of a basic shape such as a square or rectangle. The use of paper folding was more in tune with a Kindergarten student's motor ability and the results were more than satisfactory.

In concluding my unit on tessellations, I invited our eighth grade class to visit the Kindergarten and exhibit their own tessellations which they had been working on. The eighth graders were given the opportunity to explain their work, and the Kindergartners were given the opportunity to question the eighth graders about their tessellations. It was a very worthwhile experience for both classes, and an excellent way to culminate the unit.

The students were so fascinated with this topic that even after a month had passed, I was still receiving pictures of tessellations. One student even brought in a tessellation of Lego blocks to use as his show-and-tell for the day. he explained quite clearly how he used the same shape block over and over again—making sure not to overlap them or leave any spaces.

This unit was very rewarding. It allowed students at the primary level to identify and demonstrate concepts which have in the past been connected with upper grade levels. These students have been given the basic concrete foundation as well as the descriptive vocabulary necessary to continue their study of this topic.