

Grade 11 Tessellations Lesson

High School Lesson	
Several eleventh-grade students in this mathematics class have attention and perceptual difficulties.	
Learning Goal	Students explore and create tessellations.
Resources	<p>Teachers present Escher, Islamic, medieval European, and folk art to the class as tessellation examples. Resources include scissors, graph paper, glue, felt pens, index cards, and Chromebooks or iPad tablets. Additionally, the following sites are also great resources.</p> <ul style="list-style-type: none"> Tessellation Creator at NCTM's Illuminations (https://illuminations.nctm.org/Activity.aspx?id=3533) Tessellations: Geometry and Symmetry (www.shodor.org/interactivate/lessons/Tessellations) Tessellations (http://bit.ly/2d3RQF0) Geometry Playground: Activities—Grades 6–8 Exploring Tessellations (http://bit.ly/1LOzbtM)
Cross-Curricular Connections	The subjects in this lesson use literacy, art, mathematics, history, and technology. Learners explore tessellation vocabulary and concepts cooperatively and individually with projects, online sites, art, and history books. For example, tessellations are found around the globe, from Islamic art to American folk art in quilts. Vocabulary such as adjacent and vertex have more meaning to a student when he or she sees them in the tessellations, rather than just defining or choosing them as an answer in a multiple-choice exam.
Multitiered System of Supports	<p>The following occurs at:</p> <p>Tier 1—The teacher offers step-by-step, whole-class guided instruction by modeling NCTM's online digital tools (for example, demonstrate rotate, erase, hammer on Illumination's Tessellation Creator [https://illuminations.nctm.org/Activity.aspx?id=3533]). The teacher shows symmetry with an investigation of patterns on squared grids and in clothing, along with examples of translations, reflections, and rotations. He or she explains terms such as overlap, vertex, and adjacent, along with types of tessellations, using visuals and physical movements with step-by-step directions and scaffolding. The mathematics interventionist, paraprofessional, and general education mathematics teacher circulate and monitor students who work independently and in pairs, as students complete tessellation projects accessed at Geometry Playground and online assignments at NCTM as indicated in the aforementioned websites.</p> <p>Tier 2—The basic skills mathematics interventionist works with small groups in three class periods each week for forty-five-minute periods to assist the general education teacher. The mathematics interventionist assists with Tier 2 instruction, but please note that often scheduling and district protocols vary.</p> <p>Tier 3—The teacher applies differentiated instruction in small-group and one-to-one, thirty-minute daily instruction to respond to student mathematics levels. With supervision from the teacher and the mathematics interventionist, the instructional assistant monitors and assists these students with mathematics skills.</p>