

Learning Targets (objectives)	I can discover and use matrices to transform points and images on the plane.
Core Alignment	Secondary 1: N.VM.11, N.VM.12
Essential Questions	How can matrix operations be used to perform reflections and rotations on a coordinate grid?
Math Practices	Structure (SMP 7)
Lesson Outline:	<p>Animation clip.</p> <p>Questions 1-2: Review notation for representing vectors as a matrix. Review rotations and reflections. (whole class)</p> <p>Questions 3-7: Students discover matrix for transformations based on algebraic approach. (Most students will use guess and check method, or logically such as "I want to multiply 2 by -1 to change its sign, but then I don't want to add anything to it, so the other partial product needs to be 0." (small groups)</p> <p>After group exploration - Review transformation matrices for ref x-axis, y-axis and rot 90, 180, 270 clockwise about origin. (whole class)</p> <p>Questions 8-10 Use diagram in task to show polygons in a larger matrix. (whole class)</p> <p>As students work, they should observe the same matrices discovered earlier can be used to reflect and rotate a collection of points. (small group)</p> <p>Discuss how a single transformation matrix can be used to reflect or rotate a complete set of points. (whole class)</p>
Student application activity	Students will begin the activity in class, and if necessary complete at home.
Resources	Mathematics Vision Project, secondary 1 (8.11 lesson) Illustrations: Computer Animation Lesson