

## Instructional Unit Title: Transform the World

The teacher may provide straight manipulatives (e.g., toothpicks, straws) so that students can begin to develop and deepen their usage of key terminology (e.g., parallel lines, perpendicular lines, line segments, triangle, parallelogram, angles, circle, circular arc, point, line).

The teacher may provide examples of rigid transformation (reflection, rotation, translation) so that students can explore the impact on coordinates of transforming a figure on a coordinate plane.

The teacher may provide examples of rotations so that students can begin to create precise geometric and algebraic definitions of a rotation.

The teacher may provide examples of reflections so that students can begin to create precise geometric and algebraic definitions of a reflection.

The teacher may provide examples of translations so that students can begin to create precise geometric and algebraic definitions of a translation.

The teacher may provide diagrams of congruent triangles so that students can begin to formalize their understanding of triangle congruence developed in the previous learning experience.

The teacher may provide students with attributes of triangles (e.g., one angle and one side) so that students can explore which attributes are necessary to ensure congruent triangles.

The teacher may provide students with pairs of figures on a coordinate grid (only some of which are congruent) so that students can use transformations to determine congruency.

The teacher may provide examples of transformations (including those that do not preserve distances and angles in addition to examples of reflections, rotations, and translations) so that students can explore which types of transformation preserves distances and angles (i.e., creates congruent figures).

The teacher may provide students with examples of all three types of transformations so that students can gain fluency in describing transformations verbally, algebraically, and graphically.

The teacher may pose parallel line scenarios so that students can explore angle relationships of parallel lines cut by a transversal and related proofs.

The teacher may provide opportunities to investigate parallelograms so that students can explore precise mathematical proofs for properties of parallelograms.

The teacher may provide opportunities to investigate triangles so that students can explore precise mathematical proofs for properties of triangles.

**PERFORMANCE ASSESSMENT:** You are an artist and the mathematics museum (<http://momath.org/>) has created a contest for a geometric mural. They want the mural to allow visitors to create geometric proofs about polygons and congruence. Your mural will need to have triangles and other polygons that can be shown to be congruent through transformations and other geometric theorems. The mural design should include symbols for congruence, perpendicularity, and parallelism as appropriate. The mural exhibit will also need to include questions for visitors to answer and information placards with answers and proofs for each question. For example, why are the green and red triangles congruent?

*This unit was authored by a team of Colorado educators. The unit is intended to support teachers, schools, and districts as they make their own local decisions around the best instructional plans and practices for all students. To see the entire instructional unit sample with possible learning experiences, resources, differentiation, and assessments visit <http://www.cde.state.co.us/standardsandinstruction/instructionalunitsamples>.*