Grade 8 Standards Parent Resource
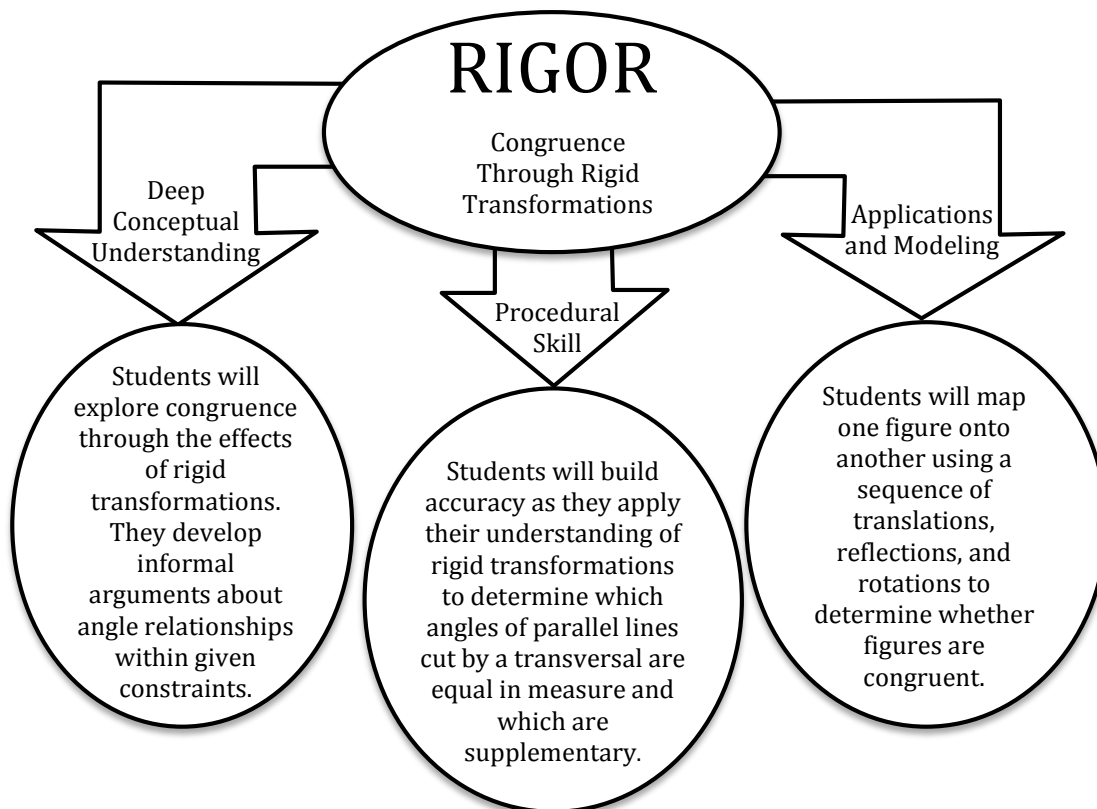
Unit #7: Transformations and Geometric Measurement

Unit 7 includes 3 topics of study, listed below. This resource is for Topic 1.

Topic # 1	Topic # 2	Topic # 3
Congruence Through Rigid Transformations	*Similarity Through Non-Rigid Transformations*	*Volumes of Cones, Cylinders, and Spheres*

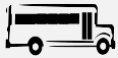| Topic	**Learning Goals by Common Core State Standard** *Students will be able to...*
Congruence Through Rigid Transformations	• Verify experimentally the properties of rotations, reflections, and translations. *Lines taken to lines (1a), line segments to line segments of the same length (1b); angles taken to angles of the same measure; parallel lines taken to parallel lines (1c).* • Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. • Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. • Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *Instructional videos in the hyperlinks above are meant to support C2.0 content, but may use vocabulary or strategies not emphasized by MCPS.*

The Common Core State Standards require a balance of three fundamental components that result in rigorous mathematics acquisition: deep conceptual understanding, procedural skill, and mathematical applications and modeling.

RIGOR — Congruence Through Rigid Transformations

Deep Conceptual Understanding: Students will explore congruence through the effects of rigid transformations. They develop informal arguments about angle relationships within given constraints.

Procedural Skill: Students will build accuracy as they apply their understanding of rigid transformations to determine which angles of parallel lines cut by a transversal are equal in measure and which are supplementary.

Applications and Modeling: Students will map one figure onto another using a sequence of translations, reflections, and rotations to determine whether figures are congruent.

Learning Experiences by Common Core State Standard

In school, your child will…

At home, your child can…

Topic #1: Congruence Through Rigid Transformations

- Verify experimentally the properties of rotations, reflections, and translations. *Lines taken to lines (1a), line segments to line segments of the same length (1b); angles taken to angles of the same measure; parallel lines taken to parallel lines (1c).*

  Visit the online resource, NLVM: Playing with Reflections
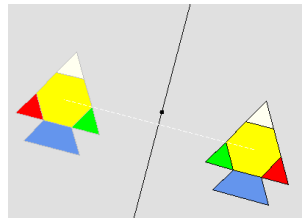
  Students click, drag, and rotate the shape on the right as they investigate the properties of rigid transformations.

- Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

- Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

  Describe the sequence of transformations that moves the red triangle to triangle *D*.
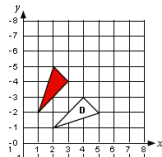
- Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

  Find the measure of angle *x*. Present an informal argument showing that your answer is correct.
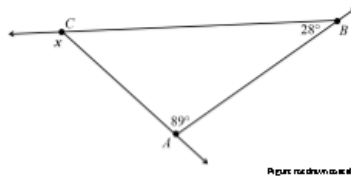
- Explore the mathematics behind game design as they visit How Did They Make Ms. Pac-Man? After exploring the situation presented, viewers should realize that Ms. Pac-Man is making a series of translations, reflections, and rotations. Discuss how placing the maze onto a coordinate grid can help increase the level of mathematical precision to help you list the path of Ms. Pac-Man.

- Play the Nrich online strategy game, L-ateral Thinking. In order to develop a winning strategy to beat the computer every time, players must apply different transformations.

- Visit the CK12 PLIX (Play Learn Interact Xplore):
  - Geometric Translations: Transformations of a House
  - Reflections: Squiggle Reflections
  - Translations, Rotations, and Reflections: Rotate the Triangle
    To access the PLIX, you will need to create a free user account.

Additional Resources

- Khan Academy: Perform Translations Use the interactive transformation tool to perform translations on a coordinate grid. (video tutorial)
- IXL: Shape Mods- Use translations, reflections, and rotations to solve each puzzle. (online game)
- Exploring Rotations through Block Designs (online exploration)
- Grade 8 Standards Unit 7 Topic 1Congruence Through Rigid Transformations (flexbook)

Additional Practice links support C2.0 content, but may use vocabulary or strategies not emphasized by MCPS.