Mathematics 8 Standards Parent Resource
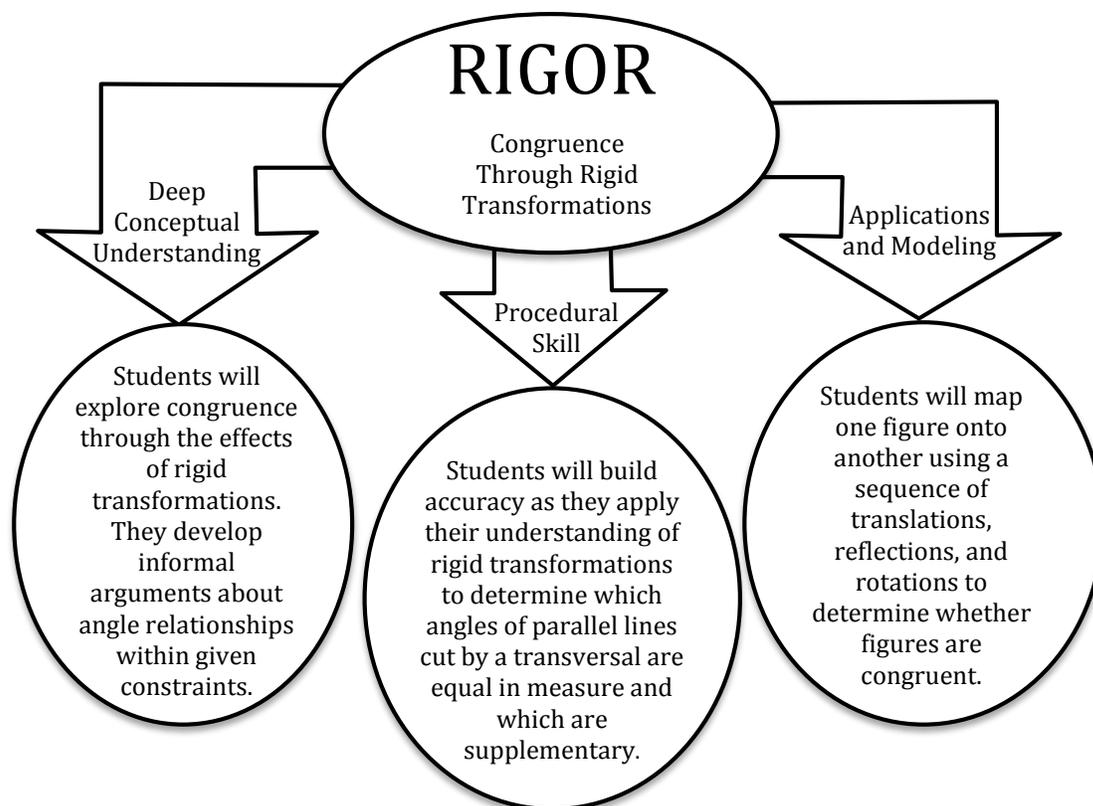
Unit #4: Transformations and Geometric Measurement

Unit 4 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

In school, your child will…

- 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
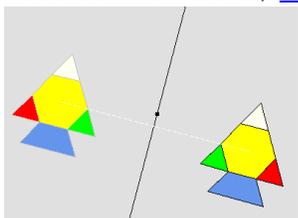
  Students click, drag, and rotate the shape on the right as they investigate the properties of rigid transformations.

- 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*.
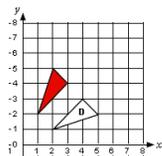
- Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

  Find the measure of angle *x*. Present an informal argument showing that your answer is correct.

At home, your child can…
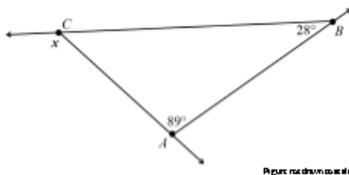
- Explore the mathematics behind game design as they visit How Did They Make Ms. Pac-Man? After exploring the situation presented, viewers should realize that Ms. Pac-Man is making a series of translations, reflections, and rotations. Discuss how placing the maze onto a coordinate grid can help increase 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)
- Mathematics 8 Standards Unit 4 Topic 1 Congruence Through Rigid Transformations (flexbook)

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