Enhancement Activities/Strategies for Gifted/High Ability Learners: Sample MATH Learning Plan

Big Idea/ Topic
Analyze two- and three-dimensional space and figures using distance, angle, similarity, and congruence

Standard Alignment
Understand congruence and similarity using physical models, transparencies, or geometry software. **MGSE8.G.1** Verify experimentally the congruence properties of rotations, reflections, and translations: lines are taken to lines and line segments to line segments of the same length; angles are taken to angles of the same measure; parallel lines are taken to parallel lines. **MGSE8.G.2** 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. **MGSE8.G.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. **MGSE8.G.4** Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two dimensional figures, describe a sequence that exhibits the similarity between them. **MGSE8.G.5** 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.

Advanced Research
Analyze this- You are a Project Engineer and you have been called to make repairs to one of the machines. This machine has four cog wheels interlocked in motion. The largest cog has 21 teeth, and the others have 17, 12 and 10 each. How many revolutions must the largest cog make before each of the cogs are back in its starting position?

Communication
Cogs and Revolutions: What is the relationship between cogs, teeth, and revolutions?   Why is this information necessary to fix the machine?   Recordings: Answer each in a Journal response OR create a 2-3-minute FlipGrid response.

Critical Thinking and Critical Problem-Solving Skills
Transformations: What type of transformation is being used in the machine? Write the transformation steps and test your theory.   What other options might be available or necessary to apply to fixing the machine?

Creative Thinking and Creative Problem-Solving Skills
What software or apps might be helpful to help fix the machine or provide a visual model? Test them out and decide which is needed/necessary to fix the machine. Include your thoughts in your Journal or Flipgrid response (listed above in Communication)   Suggestions: https://edu.sphero.com/cwists/preview/15588x   https://sketchpad.keycurriculum.com/

Awareness of Self—Student's Well-being
Tessellation – a pattern made with polygons that completely fills a space with no gaps, spaces or overlaps.   Create a tessellation with regular polygons as a "thought catcher" to help serve as a visual reminder of how we are all connected in some way and can affect each other even when we think we cannot!   Add colors to make it bright and attractive.