

**Problem Solving in Geometry
JASON Academy
Road Map**

Objective	Title of Activity	Assignment	Time
Week One			
Read package file for Week One content	Week 1 Content	Read through package file for Week One content	2 hours
Conduct an experiment	Real vs. Ideal Shapes	Teachers conduct a "thought experiment" to focus on the difference between real and ideal shapes.	.5 hours
Use an interactive applet	Polyominoes Software Lab	Use a software applet to build all the possible trominoes, tetrominoes and pentominoes. Use the build in flip and rotate commands to help verify whether two polyominoes are the same or different. Explain how you can be sure you've found all the possibilities.	.75 hours
Align the activities this week with your standards	Correlate with Local or State Standards	Correlate the activities this week with National and state or local standards. Begin a table of correlations between this course and geometry standards that will carry through the course.	.75 hours
Align the activities this week with your local problem solving standards	The Problem Solving Standard and This Week's Work	Review your local problem solving standards and correlate them with this week's work.	.5 hours
Week Two			
Read package file for Week Two content	Week 2 Content	Read through package file for Week Two content	2 hours
Compare pattern blocks and write	Pattern Block Properties and	Compare pattern blocks and make a table of their properties. Compare blocks and combinations of blocks	.5 hours

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equations	Relationships	that have the same areas and write equations indicating combinations with equal areas.	
Examine angles in pattern blocks	Angles in Pattern Blocks	Determine the interior angles of all six pattern block shapes without doing any measuring.	.5 hours
Use an interactive applet	Learn More: Shape Dissection Lab	Use a software applet to solve a series of challenges involving cutting and reassembling shapes.	.75 hours
Create problems and solve other problems	A Laboratory for Posing Geometry Problems	Use the problem domain of cutting and reassembling shapes to pose at least one easy problem and one hard problem for your colleagues and to solve several of others' problems and give feedback.	.75 hours
Examine hexagons	Construct a Hexagon	Construct a regular hexagon and draw all its chords. Then use logical reasoning to determine the angles of the triangles that are created by the intersection of the polygon's chords.	.75 hours
Week Three			
Read package file for Week Three content.	Week 3 Content	Read through package file for Week Three content	2 hours
Identify patterns	Lines of Symmetry	Determine the number of lines of symmetry in a series of regular polygons. Identify a pattern connecting the number of lines of symmetry with the number of sides and make a mathematical argument for why the pattern you find should hold true for any regular polygon.	.5 hours

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Search for sites about symmetry	Searching for Sites	Search a set of Web sites to identify designs with line symmetry, determine the number of lines of symmetry for each, and use screen captures to share your favorite examples with colleagues.	.75 hours
Create a design	Creating Symmetric Designs	Use software, paper and pencil or concrete manipulatives to create a design with lines of symmetry. Use screen captures, digital photos or scans to share your designs with colleagues.	.75 hours
Share examples of designs of rotational symmetry and answer questions	Rotational Symmetry	Find examples of designs with rotational symmetry, share and answer focus questions.	.75 hours
Construct designs with rotational symmetry	Creating Designs with Rotational Symmetry	Construct and share several designs with rotational symmetry.	.75 hours
Align the activities this week with your standards	Other Symmetries in the Plane	Correlate your work for this week with your state or local geometry and problem solving standards. Add this information to the Standards Table you began in Week 1.	.75 hours
Week Four			
Read package file for Week Four content	Week 4 Content	Read through package file for Week Four content	2 hours
Use an interactive applet	Similarity and Scaling	Use a Triangles Applet to construct a set of similar triangles using scaling, and compare the ratios of	.5 hours

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		corresponding sides within each of the triangles constructed.	
Use an interactive applet	Similarity and Proportionality	Use a Triangles Applet to construct similar right triangles using the proportionality of corresponding sides, rather than scaling as a construction method. Use the definition of similarity to verify that the shapes you've constructed are truly similar.	.75 hours
Draw and define rectangles	Families of Similar Rectangles	Given a list of rectangle dimensions, draw them on graph paper and use the diagonal line technique to place each one into one of three families.	.5 hours
Identify shapes	Similarity in Regular Polygons	Use logical reasoning and the information developed during Week 2, to identify similar shapes formed by the intersection of the chords of a regular hexagon.	.5 hours
Construct rectangles	The Golden Rectangle	Construct a nested set of golden rectangles and a golden spiral using a compass and straight edge.	.5 hours
Week Five			
Read package file for Week Five content	Week 5 Content	Read through package file for Week Five content	2 hours
Use an interactive applet	The Area of a Triangle	Use a Triangles applet to create several different triangles with the same area. Find out as much as you can about which other properties are the same and which ones are different for triangles with the same area.	.5 hours
Create a formula	Sum of the	Use the sum of the angles in a triangle to derive a formula	.75 hours

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and prove	Angles in a Triangle	for the sum of the interior angles of any polygon. Starting from an outline of the proof, prove that the formula is correct.	
Find proof of the Pythagorean Theorem	Many Cheerful Facts	Use the Internet to find at least one proof of the Pythagorean Theorem. Explain the proof in your journal.	.75 hours
Create definitions and a tree diagram	Quadrilateral Family Tree	Use an inductive problem solving process to create definitions and investigate class inclusion for quadrilaterals. Create a definition of each special quadrilateral. Then make a tree diagram showing how all the special quadrilaterals are related.	.75 hours
Align activities with your standards	Connecting to the Standards	Choose one activity from week 4 or week 5, find the correlations between that activity and your state or local geometry and problem solving standards, and add them to your chart.	.75 hours
Reflect on the course and answer questions	Wrapping It All Up	Reflect on what you've learned about geometry and problem solving and how you can make use of it in your classrooms. Reflect on the use of technology: how can it help students learn geometry? What are some of the drawbacks and barriers?	.75 hours
Reading and responding to other participants over the 5 week			3 hours

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course.			
			Total: 30 hours