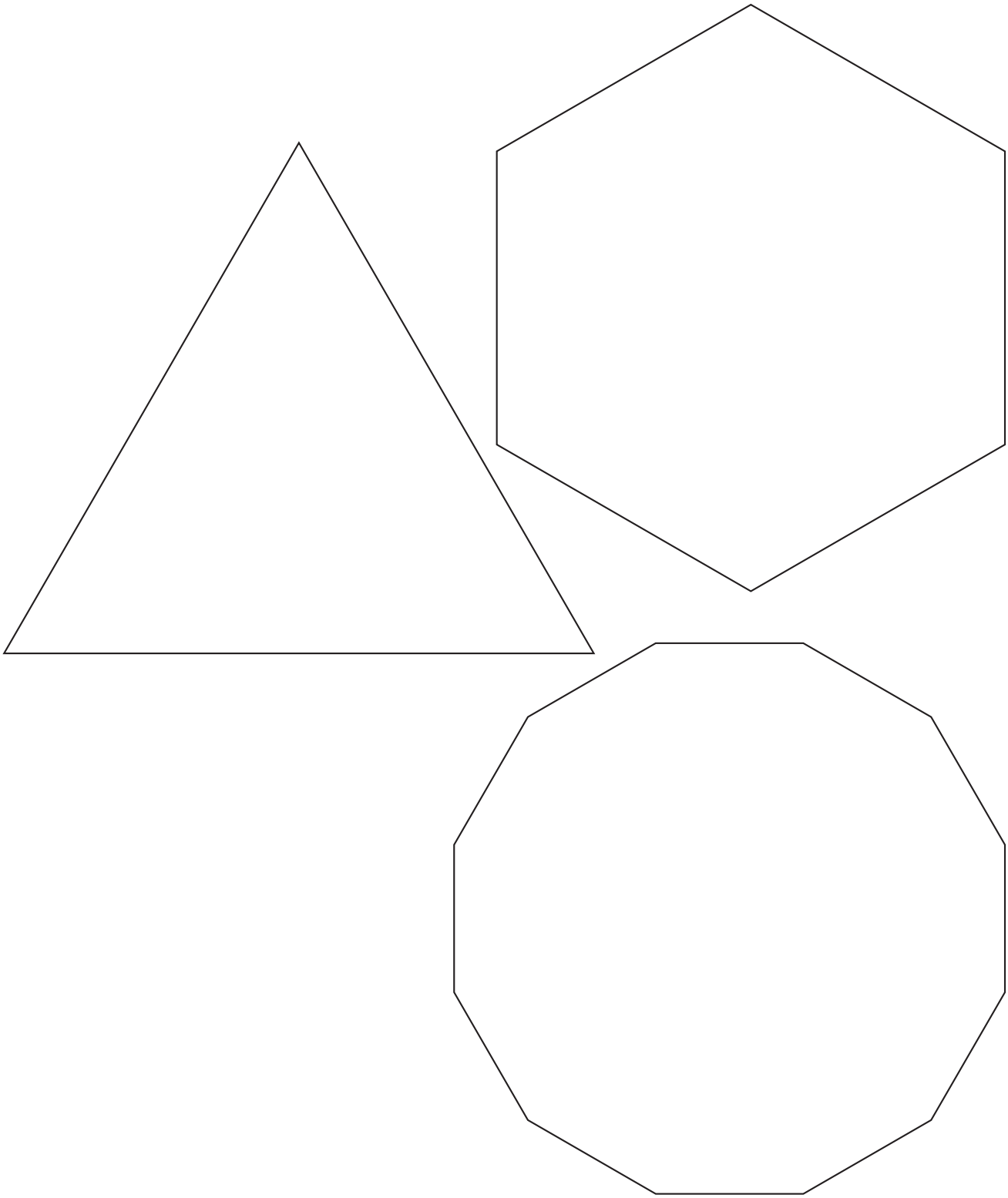
LAB 5.6
Rotation and Line Symmetry

Name(s) _____

- **Equipment:** Pattern blocks, template



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Cover the figures on the previous page with pattern blocks. You may use any number and any type of pattern blocks. Each time, draw the resulting figure with the template, and label it with its symmetry properties: If it has rotation symmetry, how many fold? Does it have line symmetry? As you find the various solutions, check them on the table below. If you can make a nonsymmetric design, check the box for 1-fold rotation symmetry. If there is no solution, put an X in the table.

	Triangle		**Hexagon**		**Dodecagon**	
	No mirror	**Line sym.**	No mirror	**Line sym.**	No mirror	**Line sym.**
1-fold						
2-fold						
3-fold						
4-fold						
5-fold						
6-fold						
7-fold						
8-fold						
9-fold						
10-fold						
11-fold						
12-fold						

Discussion

A. Which symmetry types are impossible on each of the polygons? Why?

B. What is the relationship between the number of sides of a regular polygon and the possible *n*-fold rotation symmetries once it is covered with pattern blocks? Explain.

C. Describe some strategies for finding new designs from old ones.

D. Given a pattern block figure with a certain symmetry, experiment with making it more symmetric or less symmetric by switching blocks in and out. Keep track of your strategies on a separate sheet of paper.

E. What symmetries do you think would be possible if you tried to cover a figure in the shape of the blue pattern block, with each side equal to 3 inches? Explain your prediction.

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