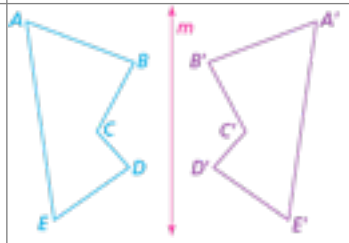
Butterflies, Pinwheels, and Wallpaper – Investigation 1 – Vocabulary

WORD	DEFINITION	EXAMPLES
TRANSFORMATION	A geometric operation that relates each point of a figure to an image point. The transformations you will study in this Unit—reflections, rotations, and translations—are symmetry transformations. A symmetry transformation produces an image that is **identical** in size and shape to the original figure. They are **congruent**.	Reflection = flip Rotation = turn Translation = slide
IMAGE	The result of a figure after a transformation whether it is a reflection, rotation, translation or a dilation. It is called the image of the original figure.	
SYMMETRY	An object or design has symmetry if part of it, the basic design element, can be transformed repeatedly to produce the entire design. In this Unit, you learned about three types of symmetry. The butterfly below has reflectional symmetry, the pinwheel has rotational symmetry, and the wallpaper design has translational symmetry.	
REFLECTIONAL SYMMETRY	A figure or design has reflectional symmetry if you can draw a line that divides the figure into halves that are mirror images. The line that divides the figure into halves is called the *line of symmetry*. The design below has reflectional symmetry about a vertical line through its center. Reflectional symmetry is sometimes referred to as *mirror symmetry* or *line symmetry*.	
LINE REFLECTION	A transformation that maps each point of a figure to its mirror image, where a line acts as the mirror. Polygon $A'B'C'D'E'$ below is the image of polygon *ABCDE* under a reflection in the line. If you drew a line segment from a point to its image, the segment would be perpendicular to, and bisected by, the line of reflection.	
BASIC DESIGN ELEMENT	A part of a pattern or design that, when transformed using at least one type of symmetry transformation, will produce the entire design.	The basic design element of the wallpaper is the boats that repeat. The basic design element of the pinwheel is one triangle that repeats 8 times….
VERTEX (**vertices** *plural*)	A special kind of point that describes the corners or intersections of geometric shapes.	vertex
PRIME NOTATION	Used to identify the image point of a transformation. The image of point A is A' (***read as: A prime***)	The image of point B is B' (B prime)
EQUIDISTANT	A point is said to be ***equidistant*** from another point if the distance away is the ***same distance*** in another direction like in reflections.	Ex: point A is 5 places away from the line of reflection and point A' is also 5 places away from the line of reflection in another direction.