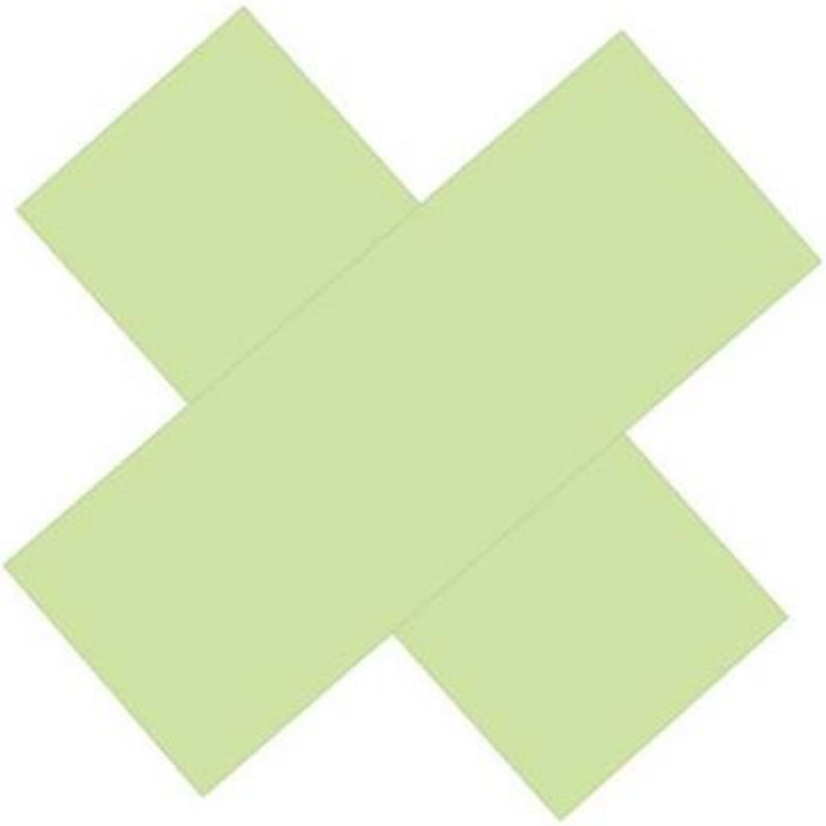
We can think of *symmetries* for an object in two different ways. First, we can think of symmetries as properties of the object. (For example, if we fold an equilateral triangle along an angle bisector, one fold will lay exactly on top of the other.)

Second, we can think of symmetries of an object as a rigid motion that maps the object onto itself (an *isometry*). No folding, cutting, or other changes to the object are made in an isometry; rather, the entire object is flipped or rotated is such a way that the object in its new position occupies exactly the same space as the object in its original position. This way of thinking will be most helpful to us.

Consider the following figure.



TASK 1: How many symmetries (isometries) does this figure have?

TASK 2: Come to a consensus in your group and describe each symmetry. Write down your group's descriptions on the next page.

GROUP CONSENSUS:

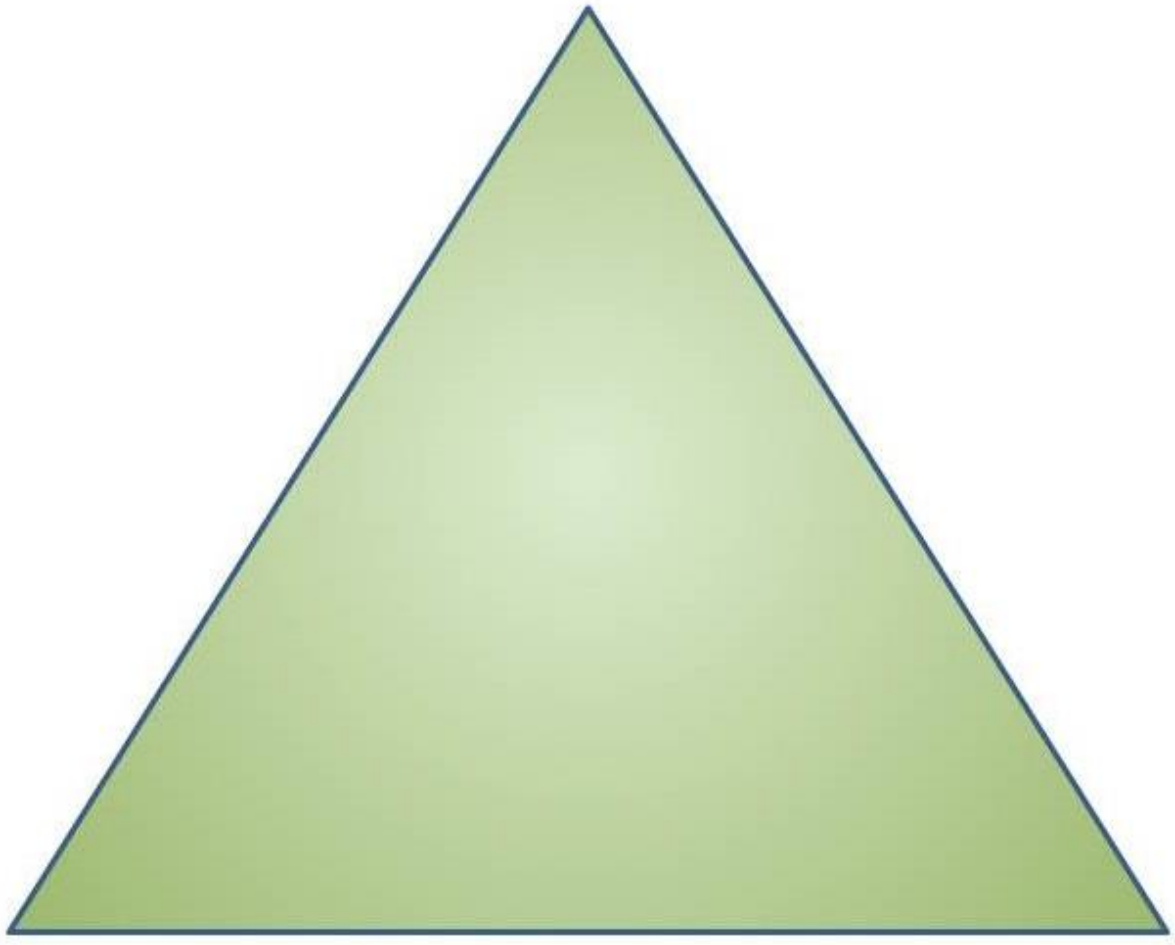
Number of symmetries ---

Description for each symmetry ---

TASK 3: How should we determine whether two symmetries of a figure are equivalent?

GROUP CONSENSUS --- Two symmetries of a figure are equivalent provided …

Consider the equilateral triangle shown below.



TASK 4: How many symmetries does this figure have?

TASK 5: For each symmetry,

a) Write a verbal description of the symmetry.

b) Draw a diagram that illustrates the symmetry.

c) Create a symbol to represent the symmetry. Your symbol should be simple enough to work with but should be descriptive as well.

DIAGRAM FOR SYMMETRY	VERBAL DESCRIPTION	SYMBOL