

Additional Information

The three main types of fold lines used in the *One Cut* activity (bisector, perpendicular and parallel) can help demonstrate the mathematical concepts of angle bisection, altitude and congruency.

Angle Bisection

Bisector lines, the dashed red lines in **figure 1**, are used to divide angles in half, and are necessary in every angle to produce the shapes and letters found in the *One Cut* activity. It is important that the bisector line run exactly through the middle of the angle, otherwise the one cut method will not generate the desired shape because the shape lines, the bold black lines in **figure 1**, will not overlap when folded.

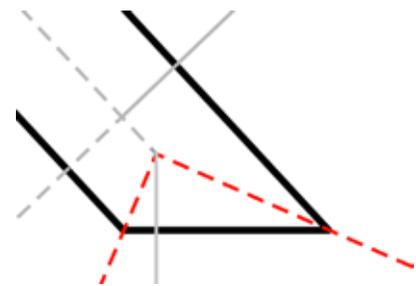


Figure 1

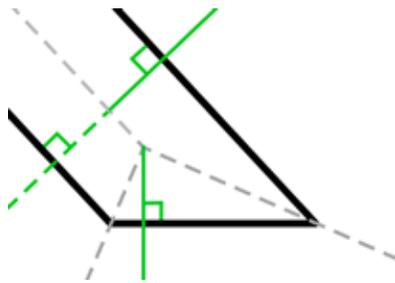


Figure 2

Perpendicular Lines

If a fold line is not a bisector line but it crosses the shape lines then it must be a perpendicular line, which means that it crosses the shape lines at a 90 degree angle (green lines in **figure 2**).

Parallel Lines

Another type of fold line that occurs often within the *One Cut* activity is shown in purple in **figure 3**. If two shape lines are parallel to each other, then there will be a fold line that is parallel to and centred between the two shape lines.

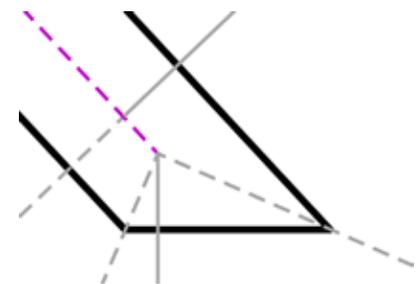


Figure 3

Altitude

The altitude of a triangle, the blue line in **figure 4**, is a straight line through a vertex and perpendicular to the opposite side. The *One Cut* activity has several examples of folds along altitude lines, as shown in **figures 5 and 6**.

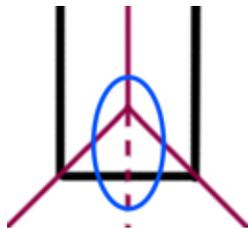


Figure 5

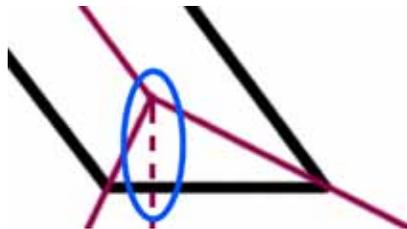


Figure 6

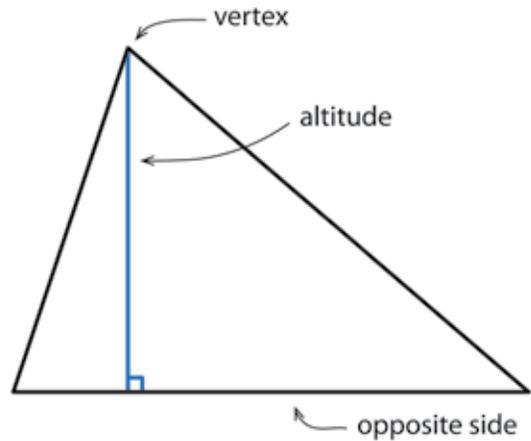


Figure 4

Congruency

In geometry, two figures are congruent if they have the same shape and size, and can be superimposed on each other through a series of translations, rotations and reflections. In the *One Cut* activity, the two shapes on either side of the "line of symmetry" are congruent. In **figure 7**, the red shape and the green shape are congruent because they are reflections, or mirror images, of each other.



Figure 7