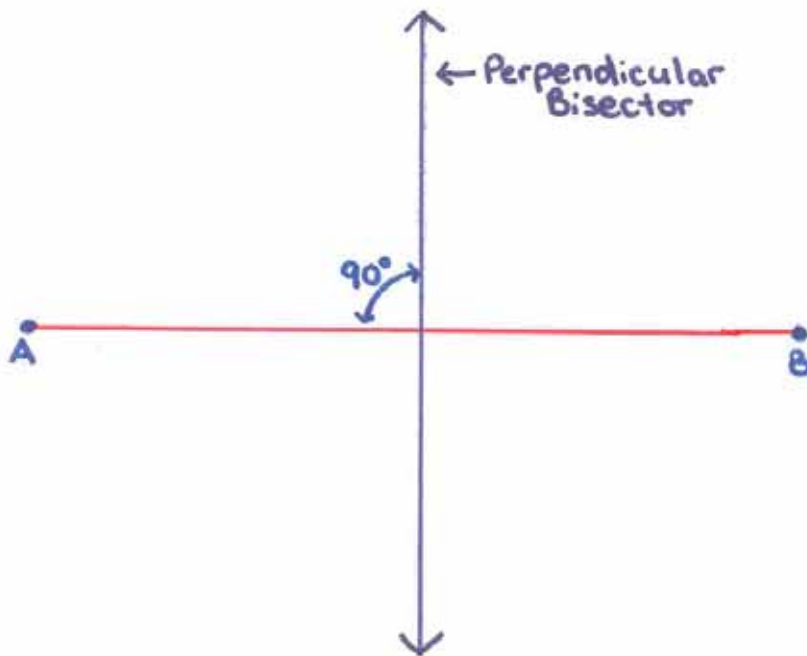# Paper Folding:
Two Basic Constructions
and Why they Work

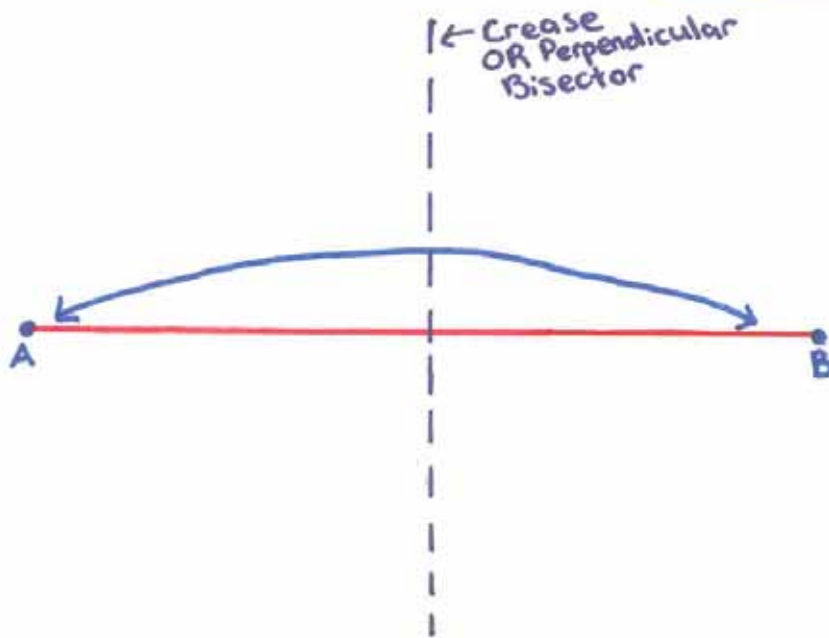## The Perpendicular Bisector

A **perpendicular bisector** is a line which cuts a line segment, AB, in half making 90 degree angles.

by Cheryl Jenkins

Finding the Perpendicular Bisector

← Crease
OR Perpendicular
Bisector

A ——————————————————————— B

Step 1: First, locate the points A and B on the line AB.

Step 2: Next, by folding the paper, put point A on point B. You should be folding the line AB on top of itself.

Step 3: Crease the paper as you fold. When you unfold, the crease is your perpendicular bisector.

Does It Really Bisect Segment AB?

How can we tell that our perpendicular bisector really bisects the segment AB? There are a few ways:

#1. When you folded segment AB on top of itself and the points A and B lined up, then you know that the line was folded in half, or bisected.

#2. Take a ruler and measure the following:
-from point A to the perpendicular bisector
-from point B to the perpendicular bisector.
If both measurements are equal, then the line was folded in half, or bisected.

The Angle Bisector

An **angle bisector** is a line that goes through an angle, cutting it into two smaller, equal angles.

Angle Bisector of ∠ABC
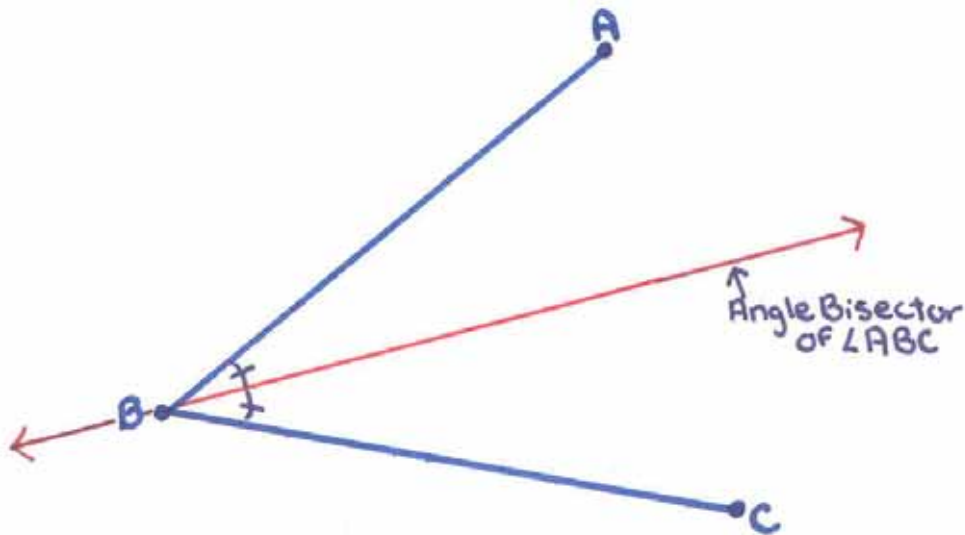
Finding the Angle Bisector

Crease
Or angle Bisector
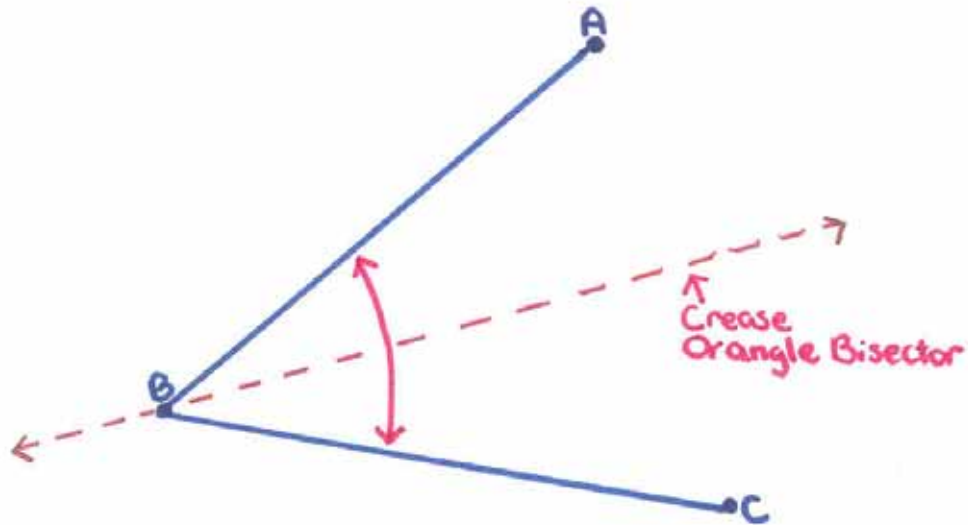
Step 1: Locate the angle to be bisected, in this case <ABC.

Step 2: Fold line AB on top of Line BC using point B as the axis.

Step 3: Crease as you are folding. When you unfold, the crease that you made is the angle bisector of <ABC.

Does It Really Bisect The Angle?

How do we know if the angle bisector we found really bisects the <ABC? There a few ways:

#1. Use scissors to cut along the angle bisector line. After you have cut <ABC into two pieces, lay the two pieces on top of one another. If they are equal angles, then they should pieces also.

#2. If you have a protractor, you can measure the following:
- measure the angle at point B from the angle bisector to line AB
- measure the angle at point B from line BC to the angle bisector

If the angle values are the same, then the angle was cut in half, or bisected.