

# HOW TO CALCULATE WING AREA BY WEIGHT

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Photo 1 shows the recently-completed wing of a Cessna CR-3 racer. I need to know the wing area so that I can calculate the wing loading of the completed model. I could estimate the area, and probably come out close, but there is an easy way to determine the actual wing area without having to use any complex calculations.

Here is what you will need: (photo 2)

1. An outline of the wing from the plan (in this case I chose to do a half wing, so the final result will need to be doubled).
2. A piece of cardboard cut to a rectangular shape – large enough to contain the wing shape. (The actual dimensions are not important).
3. A gram scale

Here is how to do it:

1. Measure the piece of cardboard that has been cut to the larger than wing shape. In this case, the dimensions are 6.5”X11.5”, or 74.75 square inches (photo 3).
2. Weigh the cardboard. My piece weighs 23.7 grams (photo 4)
3. Cut the cardboard to the exact shape of the wing section. (photos 5 and 6)
4. Weigh the cardboard with the wing shape. Mine weighs 17.6 grams. (photo 7)
5. Now, the wing area can be calculated by using the proportional weight of the cut piece of cardboard, which represents the wing area, to the original piece of cardboard (with the known area).

Wing area = (weight of cut piece) / (weight of the original piece) x (area of original piece).

For my half wing section: wing area = (17.6gm/23.7g) x (74.75) = 55.51 square inches

The total wing area then is 55.51 x 2 = 111.02 sqin.

For contest purposes, to find the **projected area** of any tilted (dihedraled) wing panel:  
multiply the *actual panel area* by (projected panel length / actual panel length) to get *projected panel area*. Then to get total **projected wing area** of the whole wing, simply add up the projected areas of the various dihedral panels.

