

# Determination Surface Area of a Leaf

## INTRODUCTION

During the study of leaf transpiration, stomatal activity provides the basis for understanding this process in plants. Some of the abiotic factors affecting transpiration include relative humidity, ground moisture, soils and mineral availability, temperature, and wind. A few of the biotic factors include root coverage, height of vascular columns, competition, vigor, total leaf surface area, and number of functional stomata.

This activity directs you to find the surface area of a leaf.


## MATERIALS

Computer	20 X 20 cm clear Plexiglas plate
LoggerPro software,	20 X 20 cm opaque Plexiglas plate
Biology ProScope	Leaf Sample
ProScope Stand,	Metric ruler
1-10X ProScope lens,	

## PROCEDURE

### SURFACE AREA

1. Select sample leaf and place it on a flat surface with a ruler along the left side of the leaf to provide scale. Place a clear Plexiglas plate on top of leaf specimen and the ruler.
2. Set-up ProScope HR with stand, 1-10X Lens, connect ProScope HR to computer, and start LoggerPro software.
3. From the Insert menu, select Video Capture with Photo Analysis and focus lens to reveal optimum detail of both the leaf and the ruled scale.
4. Take photograph.
5. **Set Origin.** Click the *Set Origin* button. Position the cursor below and to the left of the leaf on the photo then Click, a yellow coordinate system will appear on the photo. The x-axis should go directly below the leaf and the y-axis should be to the left of the leaf. A space of 1 centimeter should buffer the leaf from both axes
6. **Set Scale.** This optional step converts the units of distance measured from number of pixels into millimeters or centimeters. Click the *Set Scale* button. Drag the mouse between two distinct points on the ruler separated by at least several centimeters. A window will appear prompting you to enter this distance and its units (cm work well). Enter the distance value followed by its units.

7. Select the **Point** icon and move the cursor to a starting position on the leaf closest to the origin. With the cursor start circumscribing the leaf with points in a sequential clockwise manner. Points need to be close enough to register all directional changes in the leaf perimeter.
8. When concluding this task, make the final positional click on the starting point.
9. From either the analysis icon for integral  or from the Analyze menu select integral.
10. The result in the box on the graph gives the surface area of the leaf in square units.