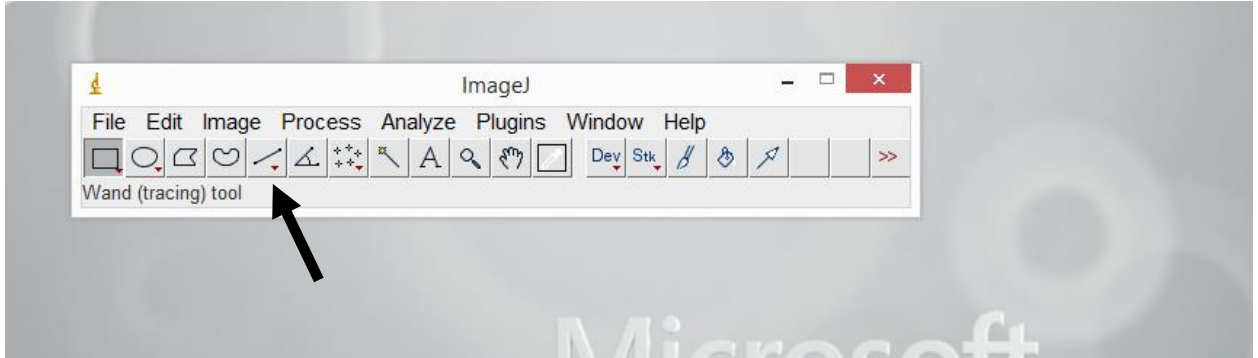Instructions for Length Analysis in Image J

1. Open ImageJ
2. Drag the photo to image J or click File>Open and select the file.
3. Click on the "line segment" button

4. Try it out: Left-Click and drag to draw a line across your image. Left-click again to clear the image.
5. Draw a line across the diameter of the bucket or container. Most buckets have a center-mark, which lets you know if you really are crossing the center.
   a. Because the buckets have rounded inner bottom edges, in white buckets, draw the line from the dark shadow ring around the lightest ring. This denotes where the walls become vertical.
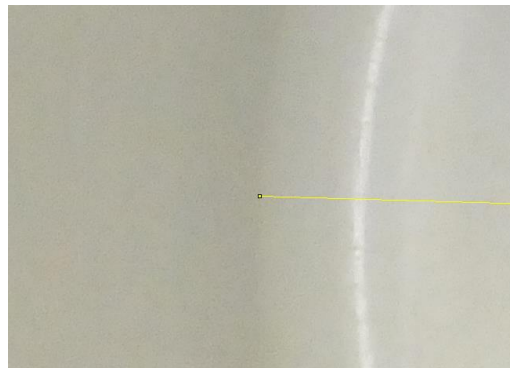
   i.
   b. The grey trashbucket is similar
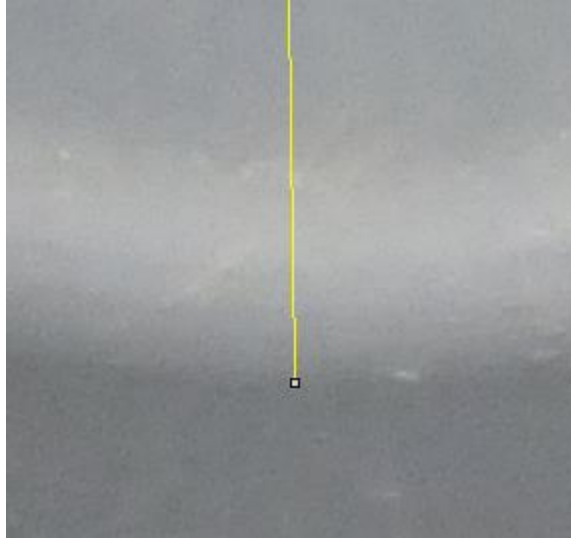
      i.

  c. For the brass cylinder , draw from where the light base meets the brass perimeter

    NOTE: All ropes are in brass cylinders. All snakes are in a white bucket except the Jamaican boa, who didn't fit so he got a grey trashbucket instead.

6. Go to Analyze > Set Scale. This tells ImageJ the scale of the image in terms of pixels per centimeter.
  a. Record the value given for "Distance in pixels."
  b. Click on "**Known Distance**" and enter the bucket diameter
    i. 25.4 for white bucket
    ii. 45.7 for grey trashbucket
    iii. 20.3 for brass cylinder
  c. Click on "unit of length" and enter "cm", hit OK
7. Right-click on the line segment tool, and in the dropdown, select "segmented line". This allows you to draw lines with multiple segments by left-clicking to start the line, left-clicking at each junction to continue the line, and right-clicking at the end to finish the line.
(Note: if it brings up something about line width, just close that window and try again.)
8. Start your line by left-clicking on either the snake's nose or the end of the rope.
9. Set your next point on the base of the skull (approximate) if it is a snake.
10. Keep left-clicking to draw a line along the snake or rope.
  a. Don't put too many points (over-specifying), and don't be afraid to let the line segment cut across part of some curves, as in the figure below.

b.

11. Right click to end your segment at the end of the rope or the snake's tail tip. Do NOT include the rattle of the rattlesnake.
12. Record the number of points you selected.
13. Do not click anywhere else in the image, it will cause the selection to vanish. If it does, hit Ctrl+Shift+E to recover it.
14. Go to Edit > Selection > Fit Spline. This fits a smooth curve to the line segments you specified.
    a. Notice how the image has changed from above

b.

15. Hit CTRL + M. This brings up an analysis of the selection, in this case your spline curve.
16. This brings up a new window. One of the entries is titled Length. Record this value.
17. Go the Canvas module for Lab 1. In the "Lab 1 Data Submission" Canvas quiz, enter the values you obtained for the number of pixels, number of points, and length for which ever item (rope or snake) you analyzed. You can also record the numbers elsewhere and enter them when you have finished all the images.
18. Repeat for all images in the "Downloads" Section of the Module.

SUMMARY:

For EACH IMAGE, you will measure the bucket and set the scale.
For EACH IMAGE, you will obtain 3 data points: the distance in pixels across the container, the number of points you selected, and the length of the rope/snake.

TROUBLESHOOTING:

If your line disappears, hit Ctrl+Shift+E to get it back.
If you get a value in the thousands for the length of your snake, check that your Set Scale function worked.
If you get no results from hitting Ctrl+M, make sure your spline curve is still selected.