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
## Calibrating “ImageJ” Software- American Chestnut Tree

The following instructions will help you understand and perform a calibration exercise with ImageJ using an image of a ruler with an American chestnut tree cross section. The ruler serves as the scale for the calibration exercise. A ruler must be present in the image to be analyzed or the scale will not be appropriate.

### Image and Measurement Set-up

1. Open ImageJ
  - a. The ImageJ tool bar should appear at the top of the screen.
2. Click **File** on the ImageJ menu bar.
3. Click **Open** from the pull down menu.
4. Locate and open the **American Chestnut Cross Section Image** file (images must be opened in ImageJ to be analyzed).
5. Click **Analyze** on the ImageJ menu bar.
6. Click **Set Measurements** from the pull down menu.
  - a. Check only the **Perimeter** box.
  - b. Enter the number **2** in the **Decimal Places** box.
  - c. Click **OK**.
7. Zoom on the ruler.
8. Click **Image** on the menu bar and then scroll down to **Zoom** and select **In [+]**.
  - a. Click on the **Hand** tool on the tool bar. Drag the ruler to the center of the window.

### Calibrating the Scale with the Ruler

9. Click on the **Straight-Line** selection tool  on the tool bar.
10. Click on the ruler at **1cm** (10mm) and drag a line to **3 cm**.

*You should see a line on the ruler between 1cm and 3cm.*

**MAKE SURE YOU ARE PRECISE AS THIS MEASUREMENT WILL BE USED TO SET THE SCALE FOR THE ACTIVITY**

11. Click **Analyze** on the menu bar
12. Choose **Set Scale** from the drop down menu.
  - a. Enter the number **2** in the **Known Distance** box.
  - b. Enter **cm** in the **Unit of Length** box.
  - c. Click **OK**.

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### Analyzing Measurement for Accuracy

13. Click on the **straight-line selection** icon on the tool bar.
14. Click on the ruler at **1in** and drag a line to **2in**.
15. Click **Analyze** on the menu bar.
16. Choose **Measure** from the drop down menu.
  - a. A **Results** box should appear.
  - b. The length displayed should be very close to or exactly 2.54cm.  
**1in = 2.54cm**
17. If your measurement is not exact or close you should go through the steps again.
18. When closing the results box you do not have to save your results.
19. Now you are ready to take tree ring measurements of the American chestnut tree cross section.