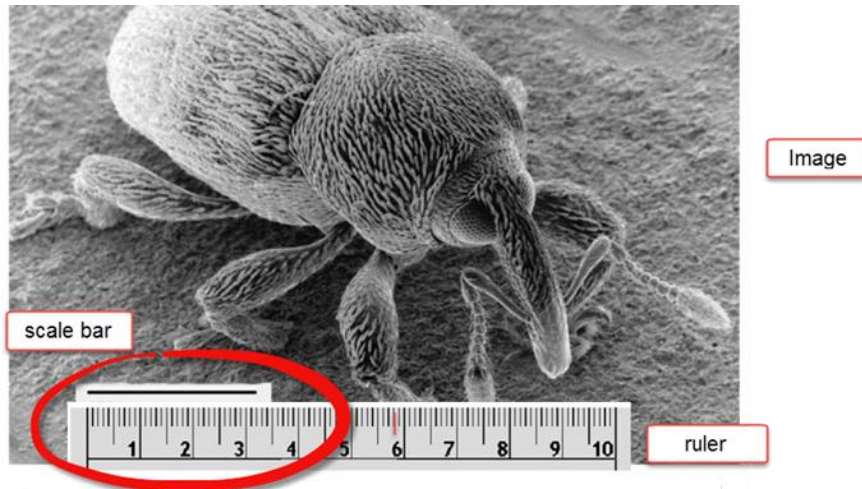


Activity 1 Calculating magnification of an image using its scale bar

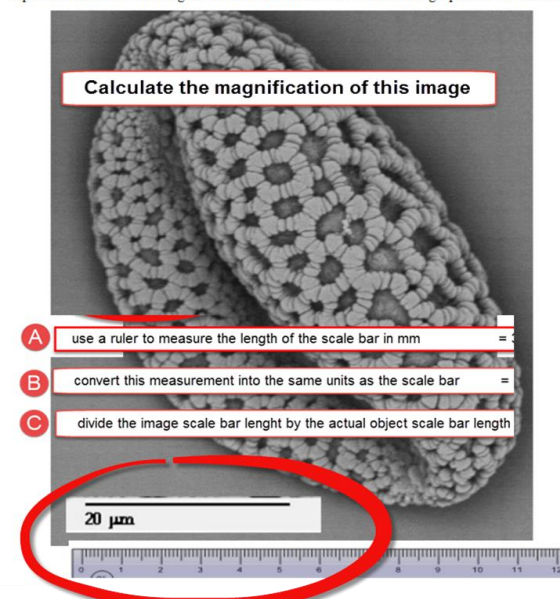
The three images below show a worked example of how to calculate sizes of cells organelles from electron micrographs step by step. Follow these steps carefully then complete the calculations on the worksheet.



- A use a ruler to measure the length of the scale bar in mm = 32 mm
- B convert this measurement into the same units as the scale bar = 32000 μm
- C divide the image scale bar length by the actual object scale bar length = 32000 / 100

Try to calculate the magnification of this pollen grain.

Electron microscope image of pollen grains from oriental
<http://remf.dartmouth.edu/images/botanical/PollenSEM/source/3.html> Image: public domain. Feb.

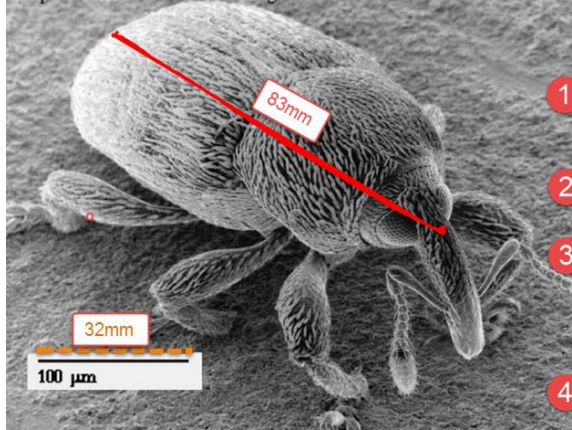


Activity 2 Calculating the size of a specimen using it's scale bar

This image shows a worked example. Look at it carefully and then try the examples yourself.

Scanning electron microscope image of a snout beetle

<http://remf.dartmouth.edu/images/insectPart2SEM/source/20.html> Image: public domain. Feb. 2012

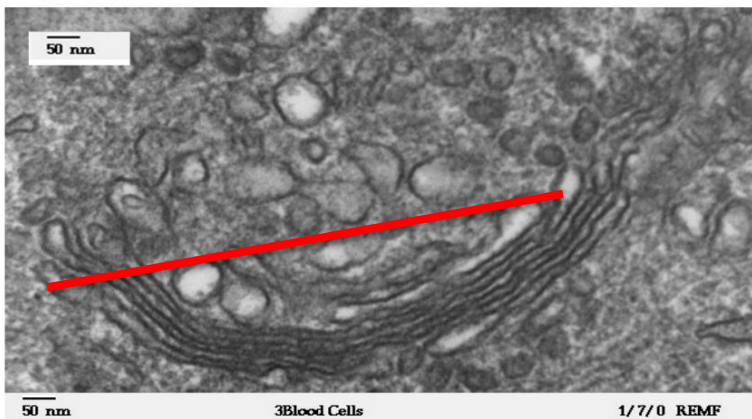


Calculating Specimen Size using a scale bar

- 1 Measure the length of the Specimen in mm.
(show working) 83mm
- 2 Measure the length of the scale bar in mm.
 32mm
- 3 Calculate how many scale bar lengths make the specimen.
(Divide length of specimen by length of scale bar)
 $83\text{mm} / 32\text{mm} = 2.6$ (no units)
- 4 Calculate the size. Multiply the scale bar label by the last answer.
(UNITS are the same as the scale bar)
 $100\mu\text{m} \times 2.6 = 260\mu\text{m}$

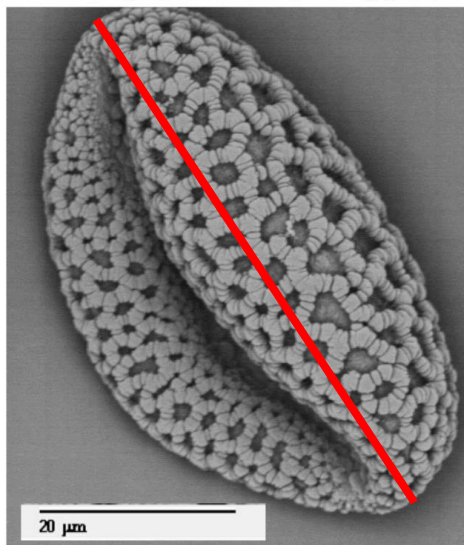
Human leukocyte - showing golgi apparatus

<http://remf.dartmouth.edu/images/humanBloodCellsTEM/source/3.html> Image: public domain. Feb. 2012



Electron microscope image of pollen grains from oriental lily.

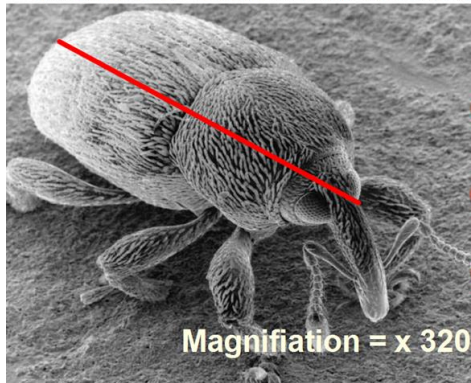
<http://remf.dartmouth.edu/images/botanicalPollenSEM/source/3.html> Image: public domain. Feb. 2012



Activity 3 Calculating specimen size using magnification of an image

Study the three steps in the image below which shows a worked example

Scanning electron microscope image of a snout beetle
<http://remf.dartmouth.edu/images/insect/Part2SEM/source/20.html> Image: public domain. Feb. 2012



Calculating Specimen Size using magnification

- 1 Measure the length of the Specimen in mm.
(show working) 83mm
- 2 convert the length of the specimen image to μm .
 $83000\mu\text{m}$
- 3 Divide the length of the specimen by the magnification.
(units will be μm)
 $83000\mu\text{m} / 320 = 260\mu\text{m}$



Try to calculate the sizes of the following specimens yourself.

Electron microscope image of pollen grains from oriental lily.
<http://web.darcnet.edu/images/boon/asp/lect32/lecture3.html> Image: public domain. Feb. 2012

