**Measuring Organelles from diagrams – Hwk**

All the pictures below are obviously images. Work out the magnification problems below. Show your workings and make sure you use the correct units of measurement for your answer.



1. This mitochondrion above has been magnified x 10,000. What is the real length of it?



1. These nuclei have been magnified using a light microscope. In real life they are 8 μm in diameter. What is this image magnification?



A

1. These plant cells have been magnified 400 times. What is the real length of cell A?



A

1. The dark vesicles are actually Lysosomes. This image has been magnified by 40, 000 times. What is its real size within a cell (measure the labelled Lysosome)?



1. Above is an electron microscope picture of a chloroplast. Work out using the scale bar (a) the maximum length of the chloroplast and then (b) how many times it has been magnified.
2. The average length of a human hair is 80 μm – using this as a ‘yardstick’ (i.e. 80 μm = 1) workout the following distances as **”hairbreadths”.**
3. The length of a bacteria measuring 200nm
4. The average human height of 1.8m
5. The length of a 3 month old foetus at 6.7cm
6. The size of a red blood cell of 10 μm