不同染劑對細胞結構的觀察

- 主題材料的適合度選擇
  - 薄片透光度(刀片或塗抹, 切片方位的決定)
  - 濕玻片的製備(如講義)

- 濕玻片的觀察
  - LM的使用
  - 標的物的搜尋(低倍)→ → → → →放大
  - 選擇多個細胞以代表族群特性
  - 試試光圈大小對細胞觀察清晰度影響
  - 大小測量
    - 利用目鏡內的測微尺規,每小格的大小如下
    - (4X, 25um→ 10X, 10um→ 20X, 5 um→ 40X,2.5 um)
  - 染色前後比較

只調細調節輪

- 觀察結果記錄
  - 繪圖
  - 照相
  - 觀察記錄(心手合一)

DRAWING IN BIOLOGY

Drawing is still a very important skill in biology. Drawings help to record data from specimens. Drawings can highlight the important features of a specimen. Photographs can be very useful for recording data but they are not very selective - they show more detail of a specimen than you might want.

Photographs of small specimens and photomicrographs cannot show the whole specimen in focus at once. A drawing is the result of a long period of observation at different depths of focus and at different magnifications. One drawing can show features that would take several photographs.

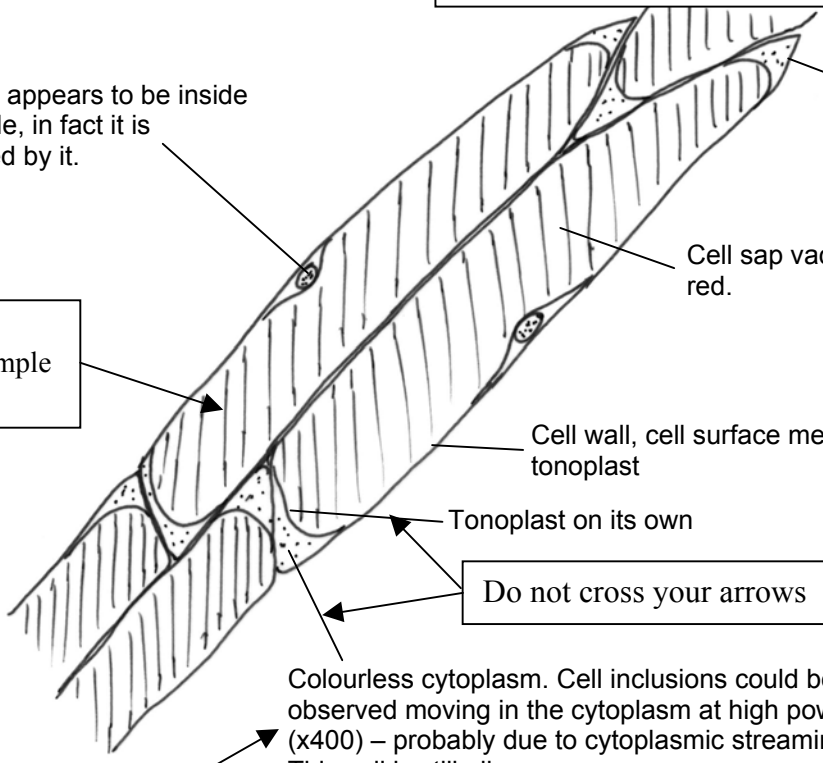
Some guidelines for drawing from specimens in biology

- Move the specimen around, **do not just concentrate on one part**. Observe the general appearance first.
- Identify the most significant features (only include detail which is necessary in your drawing).
- Determine which part or parts you are going to draw.
- Use a **sharp** HB (medium grade) pencil.
- Use **white, unlined paper** for drawing.
- Make a **large**, clear drawing, it should occupy at least half a page
- **Keep looking back at your specimen** whilst you are drawing. When drawing from a microscope it is useful to look down the eye piece with one eye and at the drawing paper with the other - it takes practice but it is possible.
- Whilst you are observing increase the magnification to observe more details and reduce the magnification to get a more general view. Use the focusing controls on the microscope to observe at different depths of the specimen.
- A drawing is incomplete without **a full title** and **a scale or magnification**. **Annotations** are particularly important, they permit you to put your observations where they will have the most impact.

Example 1 Epithelial cells from the an onion bulb (*Allium cepa*) stain with neutral red at pH 7.6 maintained at 20°C. Viewed at x100 to x400

Write a title which is informative

It is more correct to put it this way because your drawing will not be the same enlargement as the image produced by the microscope



Nucleus – appears to be inside the vacuole, in fact it is surrounded by it.

Cell wall and cell surface membrane

Cell sap vacuole stained brick red.

The shading should be simple and clear

Cell wall, cell surface membrane and tonoplast

Tonoplast on its own

Do not cross your arrows

Colourless cytoplasm. Cell inclusions could be observed moving in the cytoplasm at high power (x400) – probably due to cytoplasmic streaming. This cell is still alive

Annotations provide useful information

Example 2 Drawing a plan view: Identify the tissues, select your area, draw without including details of the cells.

Rat kidney cortex viewed at x400