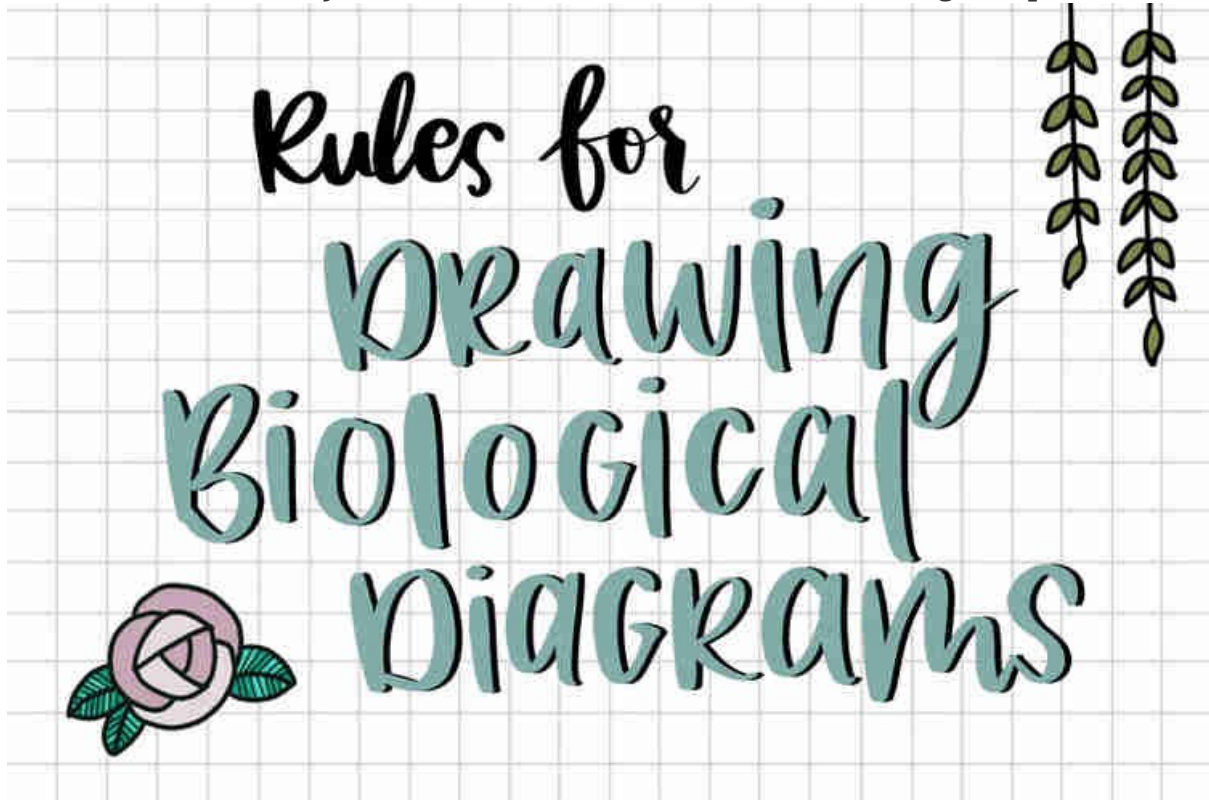


Drawing Biological Diagrams

One key skill that a Biology student must have is to draw biological diagrams. The purpose of drawing is really to encourage students to observe and to pay attention to details. They usually carry two to six marks (including calculation of magnification) which is between five to fifteen percent of the practical component. Quite pricey, I would think, so it is worth taking time to practise and ensure you do it well!

Here are some rules you should follow to score in the drawing component.



1. Draw in pencil.

Your entire diagram should be drawn with a sharp pencil, including the labels and label lines. It would be ideal to have with you, a good small tip eraser as well, so you can erase a small part of your diagram cleanly without destroying the rest.

2. Optimise the space provided.

The diagram should take up about $\frac{3}{4}$ of the space provided, including the labels. Anything too small might make it difficult to see details. Put yourself in your teacher's perspective, who has to mark at least 40 drawings, the last thing

we want to do is squint, look super closely or use a magnifying glass to see if you have drawn *that* seed in the L.S. (longitudinal section) of an apple.

3. Lines of diagrams should be clear and continuous.

For biological diagrams, the lines drawn should look clean, neat and continuous. Remember, this is not art class, so **no sketchy, broken or overlapping lines**. When drawing shapes, it's easy to create overlapping lines. These will be pretty obvious to your teacher or the examiner so when you are about to close the circle, for example, **slow down** and take extra care to seal it off neatly in the first try. Having to erase creates more gaps which you have to "patch up" later and this might just cause more overlapping lines instead.

4. No colouring or shading.

Again, a reminder that this is Biology, not art class. So, no shading or colouring unless otherwise stated. I know sometimes you just feel super tempted to do that, especially when there are differences in colours, but do **resist**.

5. Make sure the proportions are right.

All the parts in your drawing of the specimen should be in proportion, in the right size, relative to each other. Your drawing should reflect what you have observed and this would show the examiner that your attention to details is tip top.

For your information, during your O level practical examination, one of your Biology teachers in school would also be performing the same experiment at the same time. She will record the observations, draw the specimen provided, and submit it together with your scripts. This means, the examiner would have a reference diagram while marking your scripts and will know the rough proportion of the average specimen.

6. Include a title.

The title should state the specimen you are drawing. Write the title in one neat line above your drawing. Remember to underline the title.

7. About label lines..

Label lines should be **drawn with a ruler**. This is an important rule. Don't be lazy. Don't think you can freehand straight lines and bluff it off. We've marked hundreds of diagrams before, we can tell.

Do not overlap label lines. Arrange them neatly. It would be best if you could align the label lines so that the labels are written horizontally (not tilted in any angle), one above the other.

One more thing about label lines, just draw straight lines, with **no arrowheads**.

8. Calculating magnification

These are the formulae.

$$\text{Magnification} = \times \frac{\text{length of drawing}}{\text{length of specimen}}$$

Show your working when calculating the magnification. Don't forget to check the units, make sure they're the same (*cm* or *mm*) before you do the division. *The degree of accuracy for your calculated value should not be more accurate than your measured values.* For example, if the length of drawing measured is 10.0cm and the length of the specimen is 6.0cm, the magnification should be written as x1.7 (to 1dp), not x1.67.

$$\begin{aligned} \text{Magnification (when using microscope)} \\ = \times (\text{magnification of eyepiece} \times \text{magnification of objective lens}) \end{aligned}$$

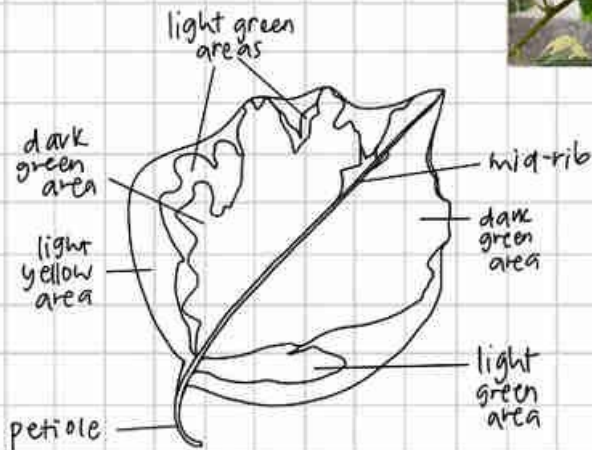
Use this when using the microscope for your drawing. For example, the magnification of the eyepiece is x10, multiply that with the magnification of the objective lens, say x40, the combined magnification would be x400.

That's it!

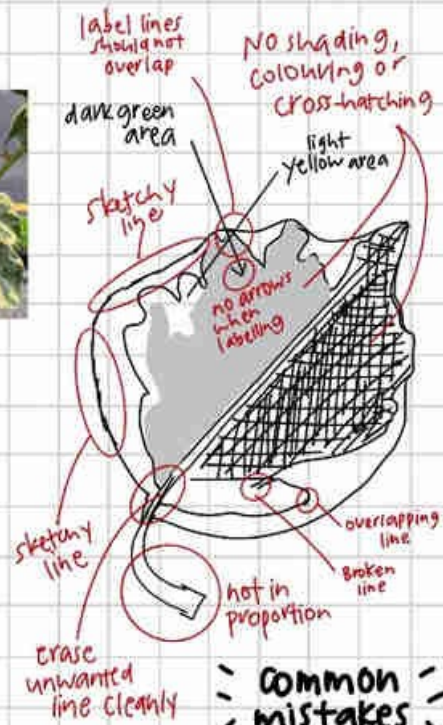
Below is a picture showing an okay drawing and some common mistakes that students make, to illustrate the points I've written about above.

Drawing of a variegated Bougainvillea leaf

A better example



FOR O Level Biology emnice@TheBiologyJotterBook



Continue practising to hone your skills in drawing biological diagrams! The effort will pay off!