Guidelines for Printing, Formatting, Titling, & Labelling Images to put into your Lab/Field Notebook

PRINTING SCIENTIFIC IMAGES

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1. Students are encouraged to alter the size of their printed images, but <u>only</u> when the size alteration improves the ability of the photograph to show what the scientist wishes others to see.

   ○ In most cases, however, a single image should <u>not</u> be as large as a single A4-sized piece of paper. A good guideline for overall image size is that the cropped image (see Formatting Printed Images) should only take up **no more than half of an A4-sized piece of paper**.

2. Scientific images can be printed in **color** OR **black-and-white**.

   ○ The choice of color *versus* no color depends on what qualities or characteristics you wish viewers to see.

   ○ Color can always be added to black-and-white photographs with **colored pencils**, which allow for good shading and/or color blending (do not use markers).

3. The use of **special photographic filters** to alter your original scientific images is encouraged, but <u>only</u> when the alteration helps viewers see what you wish them to see with **greater clarity, speed, and/or precision**.

   ○ However, any image that has been altered by a special filter must be accompanied by **a special note written just beneath the image**.

   ○ The note should communicate the proper name of the filter used, as well as the proper name of the App itself. If only certain aspects of an image have been altered by an App (e.g., "Saturation" or "Shadows"), then the note should contain the numerical values of each of the altered aspects. See the two examples below.

Example A	Example B
Device: iPhone SE	Device: iPhone 7 Plus
App: Camera	App: Instagram
Filter: None	Filter: X-Pro II
Edit > Light > Exposure, +0.41	Edit > Contrast, +53
Edit > Light > Highlights, -0.40	

FORMATTING PRINTED IMAGES

1. Crop/cut all images so that all unnecessary 'dead' space is removed. However, keep in mind that the image put into your notebook should be either **square**, **rectangular**, or **circular**.

   ○ In other words, do <u>not</u> crop/cut the image in such a way that the outermost boundary of the actual object of interest is the *only* part of the image present. There should be a buffer of blank or empty space around the object of interest.

2. Square and rectangular images should be cut at **90º angles**.

   ○ To do so, you should make use of tools such school paper cutters, plastic templates, rulers, straightedges, and/or protractors.

3. Circular images should be cut into **proper circles**.

   ○ To do so, you should make use of tools such plastic templates, circular objects (which can be used for tracing), a drafting compass, and/or a pencil tied to a piece of string.

4. Think carefully when placing and fixing **a single, cropped image** into your notebook.

   ○ Rotate the image so that viewers can see what you wish them to see as **quickly** and as **clearly** as possible.

5. Think carefully when placing and fixing **a series of cropped images** into your notebook. Have a thoughtful reason why you sequenced them as you did.

   ○ Try sequencing the images so that they tell some sort of sensible 'story'. Sometimes, it may make sense to organize a series of images in the *order* you photographed them. Sometimes, it may make sense to organize them in from the *lowest* magnification to the *highest* magnification (or vice versa).

6. Fix printed images into the notebook with a water-resistant (clear or white) **glue**.

   ○ Do <u>not</u> use staples or clear tape. Clear tape not only discolors, dries, and cracks with age, but it also makes it difficult to draw durable lines and labels.

TITLING IMAGES

1. The title of the image must name **the object of interest**, even if the object is only partially present within the image.

   ○ For example, if the primary object of interest within the image are plant cells, then the title of the image must not only include the word "cells," but also what part of the plant the cells were taken from, for example, "stem," "leaf" or "root."

2. Titles of images containing a living (or once living) organism must contain **the two-word scientific name of the organism**. The two-word scientific name of the organism should include the *Genus* (first word) and *species* (second word). Because it's difficult to create *italicize* word when using writing by hand, both of these words should be <u>underlined</u> instead.

   ○ For example, the title of picture of an embryo of a common mustard seed should include the name, "<u>Brassica rapa</u>," which could also be abbreviated as "<u>B. rapa</u>".

3. If any magnifying tools were used to magnify the image, **the total magnification** should be communicated EITHER within the title (e.g., "20x," "40x," "100x") OR just near the bottom edge of the cropped image itself.

   ○ If written near the bottom edge of the cropped image, then the magnification should be written **consistently** in the same place, for example, bottom left, bottom center, or bottom right.

   ○ A simple but **informative** title for a image or drawing of an embryo taken from a common mustard seed might be:

      'Walking stick' stage of a <u>Brassica rapa</u> embryo (14 days old) at 20x

LABELLING IMAGES

1. Do <u>not</u> use arrows, only **lines**.

2. All lines must be drawn **with a ruler**.

3. The color of the lines should **clearly stand out** against the background color(s) contained within the image.

4. Lines should <u>never</u> cross one another.

5. Whenever possible, a line should terminate **in the center/middle** of the 'thing' that it names. This is not possible, of course, when labelling the (thin) outer edges of a 'thing.'

6. <u>All</u> lines should be associated with a label. In other words, no line should 'float' freely on or near the photograph. In almost all instances, a single line should <u>not</u> be associated with multiple labels.

7. Whether written in print or cursive, all labels must be **clearly written (legible)**. In addition, all labels should use the **same case**--uppercase or lowercase--**consistently**.

   ○ If some labels use all uppercase letters and other labels use all lowercase letters, a viewer will be led to think that the different cases mean something different, in which instance they will expect to see a "key" that explains the difference(s).

8. All labels must also be **concise**, but **thorough**, and **accurate**.

9. The color of the printed or cursive label should **clearly stand out** against the background against which it is written.

10. Labels must be written **horizontally**, <u>not</u> vertically or at (non-horizontal) angles.

11. <u>All</u> labels should be associated with a line. In other words, no written label should 'float' freely on or near the photograph.

    ○ A single label may be associated with multiple lines.