

# Rules for Scientific Drawing

Purpose: To serve as a record of your laboratory work. In other words, these are your observations. They must be completed while viewing your specimen. They cannot be done “in rough” at school, and then redone at home “in good”. A scientific drawing is a precise record of specific details.

1. Use pencil and unlined paper only.
2. Draw as large as your page will allow.
3. Draw your image just the left of center, to allow for label lines on the right.
4. The boundary structures of the specimen are more important than secondary features such as shadows, curvature, and colour.
5. Stipple areas dark to indicate depth, do not shade or cross-hatch.
6. Draw clean lines; do not sketch. Structure lines should be definite, continuous and clear-cut.
7. Draw part for part, not from memory. Do not invent structures that are not there in the specimen. These are your observations!
8. Label parts you can identify with a solid straight line out to the right.
9. Do not cross label lines.
10. Label lines must touch the structure being labeled.
11. Do not add arrow-heads to the label lines.
12. Include title and specimen name (Genus and species name if known) at the top center of page.
13. Include a description of the nature of the specimen, such as the possible descriptors from the list below.
14. Include magnification and scale line if requested by your teacher.

Possible specimen descriptors:

- Cross section
- Longitudinal section
- Habit sketch
- Dry mount
- Wet mount
- Stains (if known)

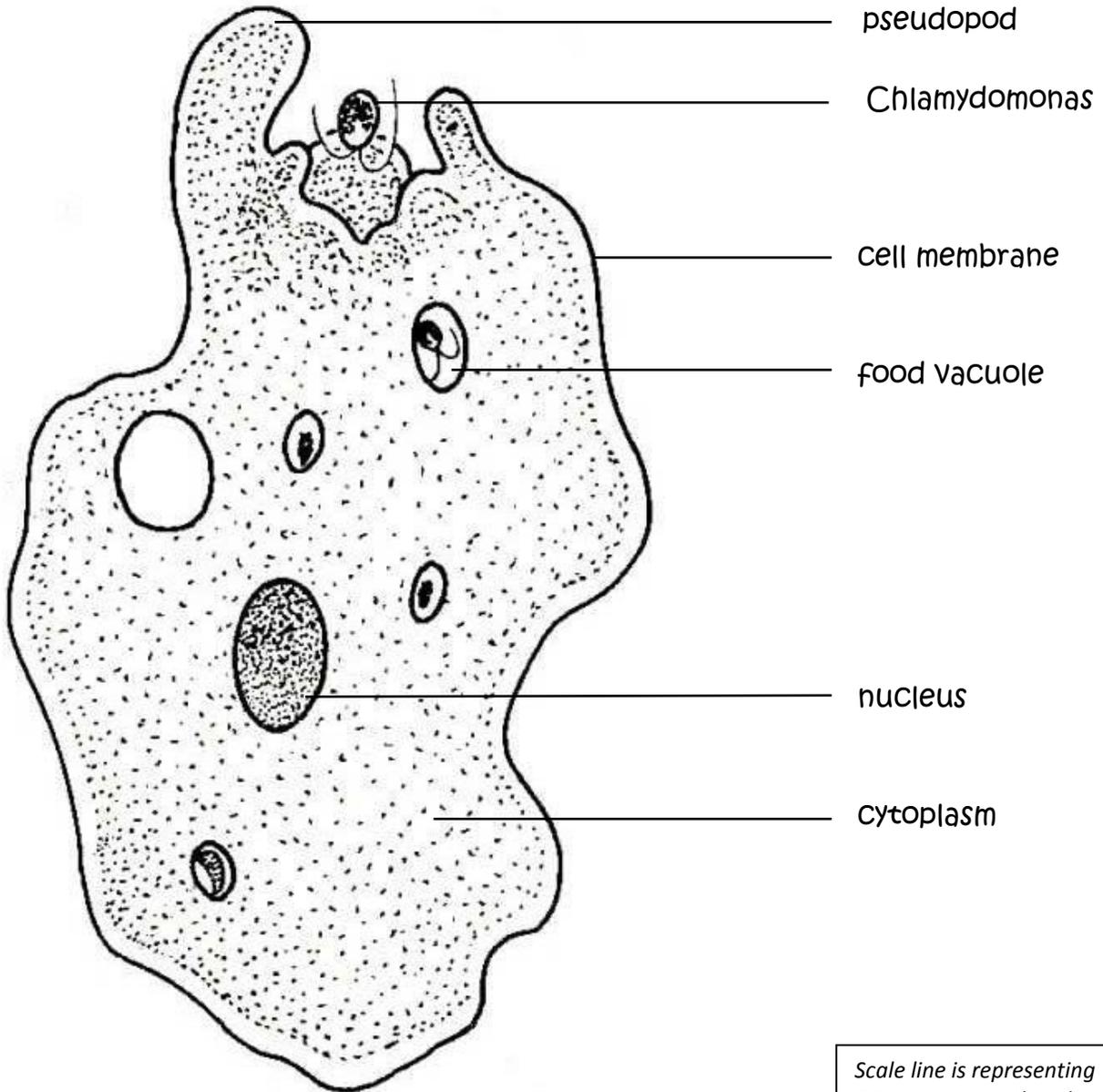
Using the example of a biological drawing on the next page to calculate the magnification of your drawing and a scale line.

Steps:

1. Compare the magnification formula below with the work shown on the sample drawing. (This drawing was done using the 10 x objective.)
2. Follow the formula below:

$$\text{Magnification} = \frac{\text{width of drawing (mm)}}{\left( \text{diameter of field of view} \div \frac{\text{number of times specimen}}{\text{could fit across field of view}} \right)}$$
$$= \underline{\hspace{2cm}} \times$$

Amoeba Feeding on Chlamydomonas  
habit sketch



$$\text{magnification} = \frac{79.0 \text{ mm}}{(2.0 \text{ mm} \div 20)}$$

$$= \frac{79.0 \text{ mm}}{0.1 \text{ mm}}$$

$$= 790 \text{ X}$$

Calculation shown for illustration purposes only. Show calculation work on reverse of page. Report only the magnification (790 X)

Scale line is representing 0.01 mm. Note that the actual length of the line is 7.9mm or 790x the size it represents.

0.01 mm (or 10 μm)

## BIOLOGICAL DRAWING CHECKLIST

### Check that you have the following items:

- \_\_\_ Blank paper
- \_\_\_ Sharp pencil
- \_\_\_ Good Eraser

### TITLE:

- \_\_\_ Underlined
- \_\_\_ Centered at top of page
- \_\_\_ Indicates cell/tissue/organ type
- \_\_\_ Type of section being viewed (i.e. cross section)
- \_\_\_ Stain used (if known)

### DRAWING:

- \_\_\_ Draw what you actually see
- \_\_\_ Space used well (i.e. as large as possible)
- \_\_\_ Drawn just left of center on the page
- \_\_\_ Proportional (to scale)
- \_\_\_ Stippled to show contrast and detail (NO SHADING)
- \_\_\_ Drawn with sharp pencil (no open circles, all lines have a distinct beginning and end)

### LABELS:

- \_\_\_ Lined up and placed on the right side of the drawing
- \_\_\_ Printed; first letter NOT capitalized
- \_\_\_ Labels are pluralized where necessary
- \_\_\_ Label lines point precisely to the structure being labeled
- \_\_\_ Label lines are drawn with a ruler, do not cross and do not end in an arrow
- \_\_\_ Labels are at end of label line, not on top of it

### BOTTOM RIGHT CORNER:

- \_\_\_ Magnification of drawing included
- \_\_\_ Estimate size of specimen (length and width) including sample calculation\*
- \_\_\_ Scale line for drawing including sample calculation\*
- \_\_\_ \*Calculations shown on back of page

### OTHER:

- \_\_\_ Date and name is in the upper right corner
- \_\_\_ Additional observations (behaviours, colours, questionable features) if appropriate

## Biological Drawings Rubric

Name: \_\_\_\_\_

Criteria	Level 1	Level 2	Level 3	Level 4
<b>Drawing (50%)</b> <ul style="list-style-type: none"><li>• Left of centre</li><li>• As large as possible</li><li>• Proportional</li><li>• Stippling</li><li>• Distinct lines, not sketched, no open circles</li></ul>	Several criteria are not met.	Some criteria are not met. Drawing is “sketched”; lacks distinct lines.	Drawing is well done, with few errors.	All criteria are satisfied. Drawing is exceptionally high quality.
<b>Formatting (50%)</b> <ul style="list-style-type: none"><li>• Title</li><li>• Name</li><li>• Date</li><li>• Labels</li><li>• Magnification</li></ul>	Major errors are evident.	Some errors are evident.	Few errors. Magnification work is not shown on back of drawing.	Complete and correct.

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