

## Comments on Drawings of Biological Objects

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Drawings have been used since people first began to note down their observations of the natural world and are a very effective way of conveying information. However, in order to convey information, drawings must conform to certain simple rules that anybody can learn.

1. A drawing is a two-dimensional projection of an object. Lines denote edges, shading denotes 3 dimensional shape.

2. Edges and shapes closer to the viewer take precedence and obscure (to varying degrees) lines and shapes that are behind them.

3. Generally, edges of objects close on themselves or disappear behind foreground shapes. They do not end free.

4. The best drawing is usually that which conveys the necessary information with the least amount of line or shading.

5. Drawing effectively requires that you study the object carefully, paying attention to the edges, boundaries and variation of shading that makes it look the way it does.

6. The drawing size should be large enough to allow rendering of necessary detail. It should also be large enough so that line thickness is very small compared to the image size.

7. Effective drawings do not require high levels of artistic talent. With some attention to process and vision, anyone can do it.

Below are two simple drawings of micro-organisms. With minimal line and no shading they convey the general shape, the shape of components, and the relationship of the components to one another, including some aspects of the 3-dimensional structure.

