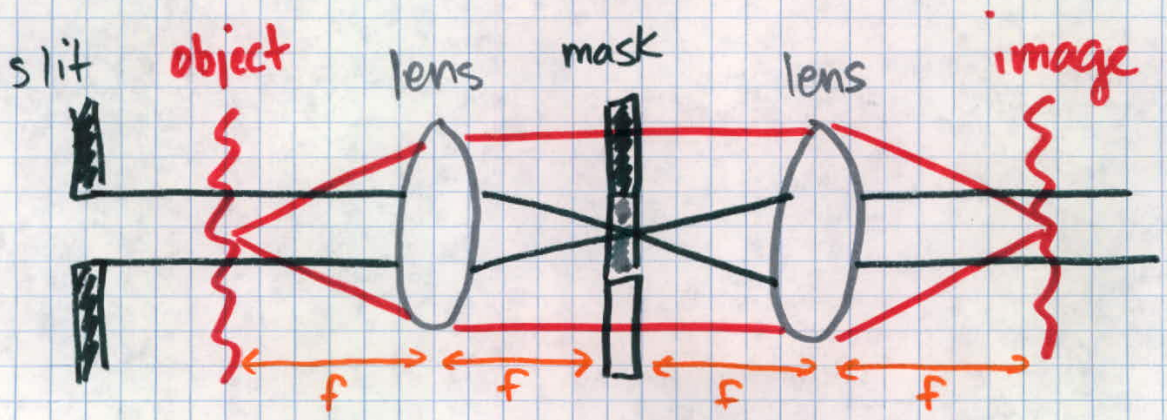
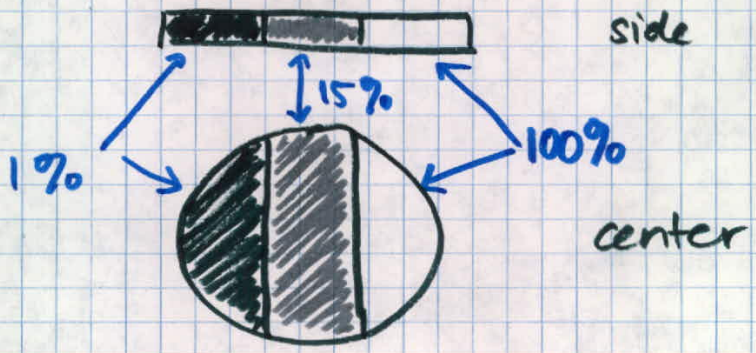
A special microscope is designed as follows:





Assume the object is a pure phase object (ie - it does not change the amplitude of the transmitted beam). Ignore diffraction.

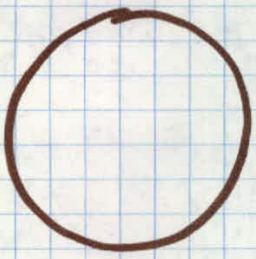
Q1: what does it do?

Q2: Draw a front-view (center) image of a cell with the following front and side profiles:

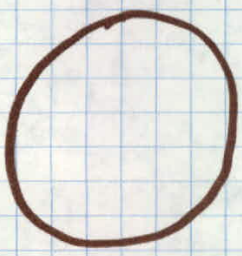
FRONT

SIDE

a)



b)

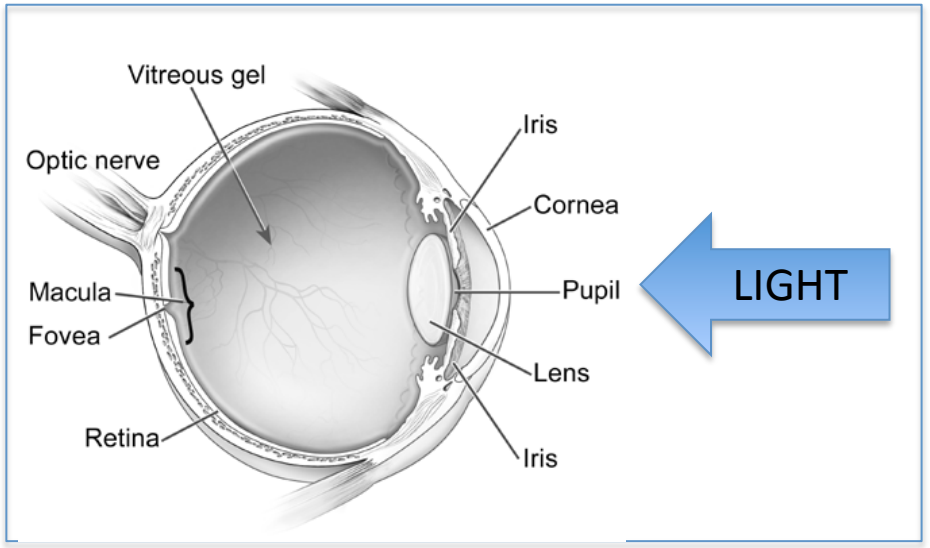


Assume the cell has a constant index of refraction.

The eye as an optical system

Your eye is an optical system with a built-in lens (lens) and detector (retina). Today you will design and carry out a series of experiments to measure its various properties. Assume the distance from your lens to your retina is roughly 22.4 mm.

If you need me to help me hold something for you, please ask. If there is an experiment you believe you do not have the right materials to perform, draw and write out an experimental protocol that would be appropriate, including materials needed.



- Size of aperture stop (pupil)
- Range of focal lengths
- Resolution
- Field of view
- Depth of field
- Sensitivity
- Location of your blind spot
- Number of photoreceptors

NOTE: It is not expected that you complete all of them, but rather that you demonstrate rational thinking skills in a timely manner.