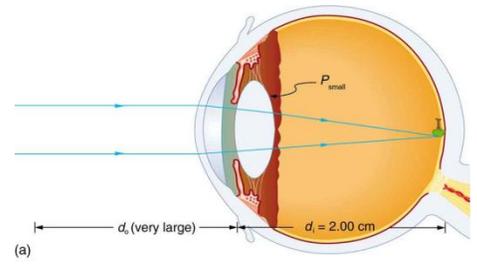


**Physics of the Eye**

- Cornea/Lens act as \_\_\_\_\_ thin \_\_\_\_\_
- To see something in focus the \_\_\_\_\_ must be on the \_\_\_\_\_ at \_\_\_\_\_ of eye
- Lens can change \_\_\_\_\_ to focus objects from different object \_\_\_\_\_



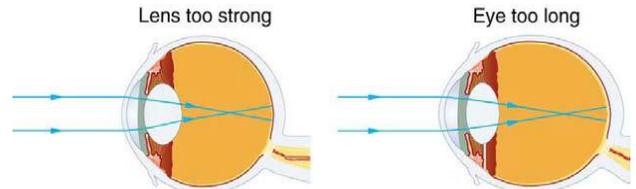
**Vision Correction**

Near-sightedness

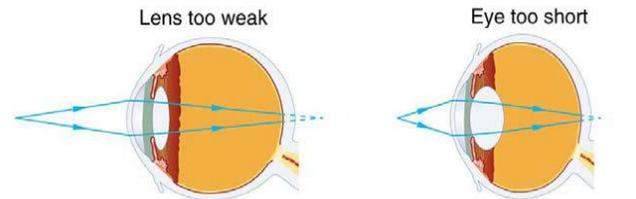
- \_\_\_\_\_
- Image in \_\_\_\_\_ of retina
- Correct with \_\_\_\_\_ lens

Far-sightedness

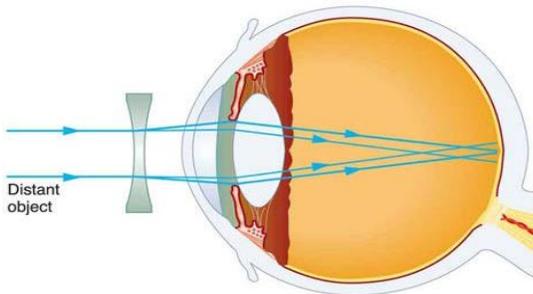
- \_\_\_\_\_
- Image \_\_\_\_\_ retina
- Correct with \_\_\_\_\_ lens



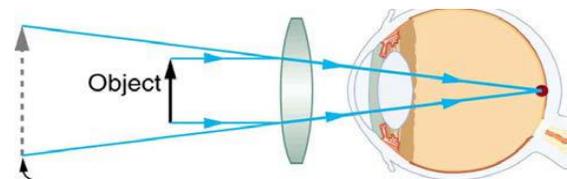
(a) Myopia



(b) Hyperopia



**Myopia**



**Hyperopia**

What power of spectacle lens is needed to correct the vision of a nearsighted person whose far point is 20.0 cm? Assume the spectacle (corrective) lens is held 1.50 cm away from the eye by eyeglass frames.

## Color Vision and Color

### Photoreceptors in Eye

- Rods
  - \_\_\_\_\_ sensitive (see in \_\_\_\_\_)
  - No \_\_\_\_\_ info
  - \_\_\_\_\_ vision
- Cones
  - Centered in \_\_\_\_\_ of retina
  - Work in \_\_\_\_\_ in \_\_\_\_\_ light
  - Give \_\_\_\_\_ info
  - Essentially \_\_\_\_\_ types each picking up one \_\_\_\_\_ color

### Color

- Non-light producing objects
  - The \_\_\_\_\_ we see is the color that \_\_\_\_\_ off the object
  - The object \_\_\_\_\_ all the other \_\_\_\_\_
- Light-producing
  - The color we \_\_\_\_\_ is the color \_\_\_\_\_

## Homework

1. A cataract is cloudiness in the lens of the eye. Is light dispersed or diffused by it?
2. When laser light is shone into a relaxed normal-vision eye to repair a tear by spot-welding the retina to the back of the eye, the rays entering the eye must be parallel. Why?
3. If the cornea is to be reshaped (this can be done surgically or with contact lenses) to correct myopia, should its curvature be made greater or smaller? Explain. Also explain how hyperopia can be corrected.
4. If there is a fixed percent uncertainty in LASIK reshaping of the cornea, why would you expect those people with the greatest correction to have a poorer chance of normal distant vision after the procedure?
5. A pure red object on a black background seems to disappear when illuminated with pure green light. Explain why.
6. What is the power of the eye when viewing an object 50.0 cm away? (OpenStax 26.1) **52.0 D**
7. Calculate the power of the eye when viewing an object 3.00 m away. (OpenStax 26.2) **50.3 D**
8. (a) The print in many books averages 3.50 mm in height. How high is the image of the print on the retina when the book is held 30.0 cm from the eye? (OpenStax 26.3a) **-0.233 mm**
9. Suppose a certain person's visual acuity is such that he can see objects clearly that form an image 4.00  $\mu\text{m}$  high on his retina. What is the maximum distance at which he can read the 75.0 cm high letters on the side of an airplane? (OpenStax 26.4) **3.75 km**
10. What is the far point of a person whose eyes have a relaxed power of 50.5 D? (OpenStax 26.6) **2.00 m**
11. What is the near point of a person whose eyes have an accommodated power of 53.5 D? (OpenStax 26.7) **28.6 cm**
12. A very myopic man has a far point of 20.0 cm. What power contact lens (when on the eye) will correct his distant vision? (OpenStax 26.16) **-5.00 D**
13. Repeat the previous problem for eyeglasses held 1.50 cm from the eyes. (OpenStax 26.17) **-5.41 D**
14. A myopic person sees that her contact lens prescription is  $-4.00$  D. What is her far point? (OpenStax 26.18) **25 cm**
15. Repeat the previous problem for glasses that are 1.75 cm from the eyes. (OpenStax 26.19) **26.8 cm**