Science 8

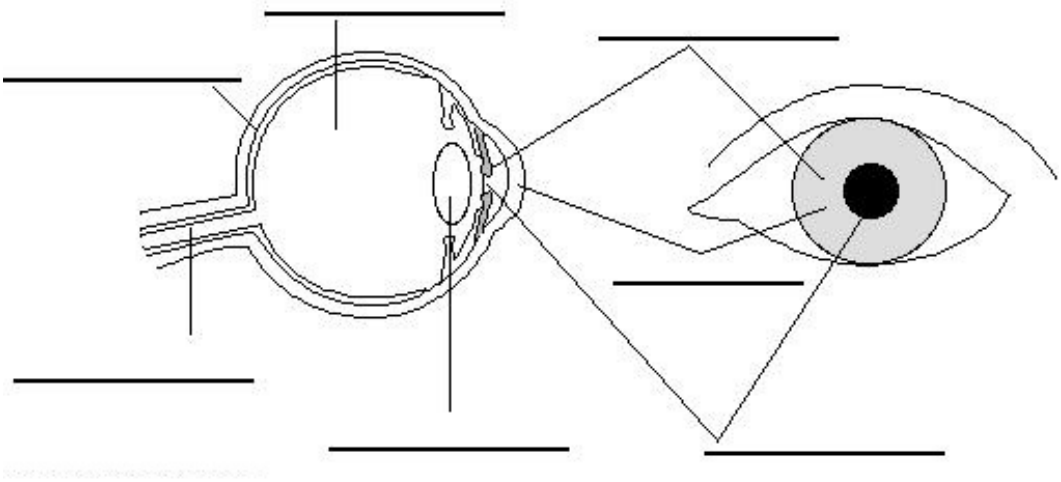
Optics VIII

Name:
Date:
Block:

1. **Black and White Vision and Colour Vision**
2. **Correcting Focus Problems**
3. **Blindness**

Label the following diagram:

- Cornea
- Lens
- Iris
- Optic Nerve
- Pupil
- Retina
- Watery Fluid



Black and White Vision and Colour Vision

There are specialized _____ in your retina that absorb and detect light.

1. <u>Rod Cells</u>
   - Our brain uses rod cells to detect _____ and _____.
   - This is called our _____.

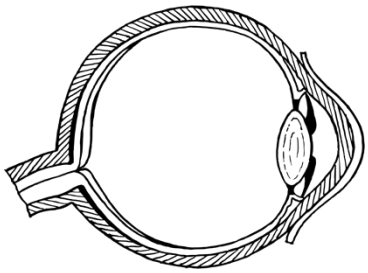
2. <u>Cone Cells</u>
   - Cone cells are used to detect _____.
   - There are three types of cone cells that detect the colours _____, _____, and _____.
   - These three colours are important because they are the _____ _____.

Correcting Focus Problems

1. Normal Vision
   - Most of the fine-focusing takes place in the _____.
   - The _____ is able to fine-tune the image by changing its shape.
   - The lens is _____ in shape and the light rays _____ at the retina.

2. Near-Sighted Vision
   - People who are near-sighted can see _____ objects but cannot see _____.
   - The eye has a _____ shape than the normal eye.
   - The lens converges the light rays to form an image _____ _____ of the retina causing a fuzzy image.

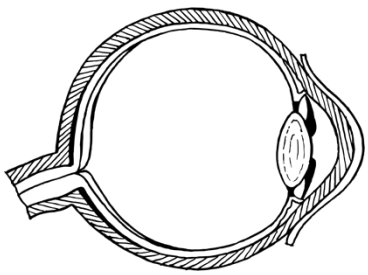
Draw a diagram of an eye of an individual who has near-sighted vision.



- Vision is corrected with a _____ lens.

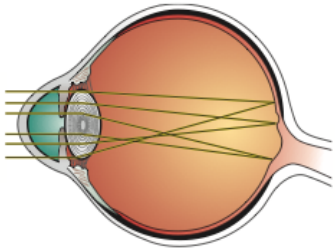
3. Far-Sighted Vision
   - People who are far-sighted can see _____ objects but cannot see _____.
   - The eye has a _____ shape than the normal eye.
   - The lens converges the light rays to form an image _____ the retina causing a fuzzy image.

Draw a diagram of an eye of an individual who has far-sighted vision.



- Vision is corrected with a _____ lens.

4. Astigmatism
    - Astigmatism is caused when the _____ has a _____ shape.
    - The image focuses on more than one point on the _____.
    - Astigmatism can be corrected using _____ or _____ _____.
    - An individual can also undergo _____ _____ to reshape the _____.



Blindness

- Blindness is any _____ _____ that keeps an individual from taking part in life's activities.
- It can range from not being able to detect any light to being able to perceive some light.
- Blindness can often be a result of _____ or _____.

Snow blindness:

- Painful condition of temporary, partial or complete blindness caused by overexposure to the _____.
- Can be prevented by wearing _____.
- Treatment for snow blindness is: _____.

Night blindness:

- Difficult or impossible to see in _____ light.
- The most common cause is the _____ _____ losing their ability to respond to light.

Colour blindness:

- The ability to see only in shades of _____.
- It occurs in about one person in every _____.
- An advantage of a person who is colour-blind is that it _____.
- The most common kind of colour vision deficiency is the inability to tell _____ and _____ apart.

Questions:

1. Why are children in developing countries at a greater risk of becoming blind?

2. How does an irregularly-shaped cornea cause astigmatism?

3. How can snow blindness be prevented?

4. If a person had damage to their cones, how would their vision be affected?

5. What are the two parts of the eye involved in focusing?

   _____ and _____

   a. Which does the majority of the focusing?

   b. Which does the fine-focusing?

6. What kind of lens corrects near-sightedness? Draw a diagram to explain your answer.

7. What kind of lens corrects far-sightedness? Draw a diagram to explain your answer.