Activity 1 Sensing Properties of The Human Eye

Group Activity. In this activity you will measure and test some sensing properties of the eye.

Things needed: Meter stick or tape measure, ruler, calculator, colored flat paper, black cloth or dark room, printed text

Near point.

1. Cover one of your eyes with your hand (do not close this eye or squish it). Hold a piece of paper with text close to your other eye and slowly move it away until you clearly see letters. Keep moving the paper until you lose focus again. Measure the distance between your eye to the positions of the paper at which you start losing focus.
2. Do the same routine for each eye. Our eyes in general do not have the same focal distance.
3. Tabulate each members's near point measurements and depth of focus/

Q. On the average the adult human eye can focus at around 25 cm. Farther than 25cm means the person is farsighted or has hyperopia. The opposite is nearsightnedness or myopia. Which among your group mates have “normal” vision, hyperopia, or myopia?

Maximum angle of peripheral vision

1. Measure the interpupilary distance of the eyes of each groupmate.
2. Binocular vision - Have each of your groupmate fixate at a point on the wall. Keep the eye from moving left or right. At a fixed distance perpendicular distance from the eyes, move two identical pens from the middle of vision to the periphery until he/she can no longer see it. Measure the angle
3. Hold both pens horizontally and move it up(down) until your partner no longer senses it. Measure the angle as in step (1)

Q. Is there a significant difference between side-to-side angle and up and down?

Visual Acuity

The *fovea* is the region where the cone photoreceptors in the eye are highly concentrated. It is a small area and is responsible for our ability to see fine detail within a very small area in our field of view.

1. Find a paper with several lines of small text (font size 8 to 12 pts.) Tape on a wall and have a groupmate stand 25 to 50 cm from the text and fixate on a letter on one of the sentences of the text.
2. With a finger, cover the letters nearest the point of fixation and one by one uncover each letter. Each time a letter is uncovered ask the subject if the uncovered letter is still discernible and stop at the letter when the subject can no longer identify the letter. Measure the distance from the fixation point to the last discernable letter and compute the angle from the center line to that letter.
3. Repeat for all groupmates

Q. Is there any significant difference in angle among your group?

Scotopic and Photopic Vision

1. This activity must be done in a dark room. If you cannot find a dark room, you may cover the head with black cloth or bag. Careful not suffocate your groupmate.
2. Gather colored strips or rectangles of paper each having a color of the rainbow.
3. Have a groupmate adapt to a dark environment for 30 minutes.
4. Randomly line up all the colored papers and have the dark-adapted groupmate identify the colors he or she can sense.
5. Slowly let in some light and ask your groupmate which colors he/she begins to perceive. Tabulate the order of the colors as they are perceived.
6. Repeat for all groupmates.

Exploration

Research about other properties of human vision and and implement experiments to measure or probe these properties.

