

See the Future!

Your Vision as You Age

Teacher Guide

Objectives

Participants will:

- Understand changes in eyes and vision as we age
- Learn how to protect their vision
- Become aware of warning signs of possible eye disorders
- Be able to identify the most common eye disorders in later life

Materials Needed – Teacher

- Teacher Guide: “See the Future! Your Vision as You Age”
- Vision test poster
- Optional: Yellow cellophane, cut into wide strips for participants to hold over their eyes
- Lists, written on newsprint, of (a) normal vision changes associated with aging and (b) suggestions for living with low vision (see samples below)

Vision Changes Associated with Aging	Living With Low Vision
<ol style="list-style-type: none">1. Harder to focus close up2. Small print harder to see3. Takes longer to switch focus from near to far4. Peripheral vision reduced5. Lens of eye yellows6. Harder to see in dim light7. Takes longer to adapt to changes in light levels8. More sensitive to glare	<ol style="list-style-type: none">1. Increase light levels2. Control glare3. Mark edges4. Allow more time5. Add safety measures6. Keep objects in the same place7. Use low-vision aids

Materials Needed - Participant

FCD05-05 Participant handout:

- Eye Care Vocabulary and Amsler Grid
- Anatomy of the Eye
- Tips for Eye Care
- Common Vision Disorders

FCD05-06 Informed consent statement / Lesson Evaluation

(Print these on separate pages so that members can take the consent statement home with them.)

Before Participants Arrive

- For the 20/20 distance vision tests, hang a vision test poster on a lighted wall and mark a spot 20 feet from the chart for participants to stand while taking the test.
If the “Normal Vision”(3/8 inch high) line can be read at 20 feet, that is 20/20 vision.

As Participants Arrive

- Suggest participants test themselves using the eye chart (or, participants could do this at the end of the meeting).
- Distribute participant handout packet and encourage participants to work on “Vision Vocabulary” as they wait for the lesson to start.

Introduction

You should expect to see clearly in the future. Not with a crystal ball, but with healthy eyesight. Some vision changes are a normal part of aging. However, significant changes or loss in vision are not normal, age-related changes. If you do experience them, you should contact your eye care professional immediately.

There is much you can do to protect the health of your eyes, which will in turn help you stay safe and independent.

This lesson will help you understand:

- Normal changes in eyes and vision as you age
- How to protect your vision
- Warning signs of possible eye disorders
- Most common eye disorders in older people

Ask the Group

What does having good vision mean to you?

To stimulate discussion, you might suggest the following:

- *Independence*
- *Safety*
- *Can drive safely*
- *Ability to participate in hobbies*
- *Ability to read books and newspapers*
- *Can watch television*
- *See loved ones' faces*
- *Look at family pictures*
- *Read lips and see facial expressions to understand conversations better*
- *Follow instructions on medications*
- *Pick out matching clothes and see stains on clothes*
- *Less likely to fall and break a bone*
- *See your grandchildren grow up*

Normal vision, often referred to as “twenty-twenty” (20/20) vision, means you can read printed letters that are $\frac{3}{8}$ inch high from 20 feet away. Many people can see better than this. A vision of 20/40 means you can read the letters at 20 feet that a person with normal vision can read from a 40-foot distance. The Snellen Chart used for this test was created by Dutch ophthalmologist Hermann Snellen, in the late 1800s. For a driver’s license, Oregon Division of Motor Vehicles (DMV) requires that you have at least 20/40 vision in one eye; this can be with glasses or contacts.¹

One out of two people in the U.S. requires corrective lenses.² Eyeglasses and contacts correct many vision problems, and minor adjustments in environment or lifestyle can compensate for other vision

problems. However, some vision changes can dramatically affect a person's life. Nearly 17 percent of the population over age 40 has a problem with their vision that affects their lives in some way.³

You can get a very rough idea of your visual acuity with the eye chart included in this lesson. However, this and other self-tests we will try today cannot substitute for a check-up by your eye care professional.

The motto of the Sight Council of America is "Check Yearly, See Clearly". Annual eye check-ups are an essential part of health maintenance as we age. Think of them as an investment in your future health, safety, and independence, not as an inconvenience or an unnecessary expense.

Participant Handout

Refer participants to the handout "Anatomy of the Eye." The names of parts of the eye that participants should note are underlined in the text below. Additional parts of the eye are included on the handout.

Let's take a look at a diagram of the eye and learn how our eyes work.

When we look at an item or scene:

- The light reflected by that image enters the eye through the curved, clear cornea on the outside of the eye, the small black pupil in the center of the eye and then the lens behind the pupil, which is also clear but thicker and smaller in diameter than the cornea.
- The cornea and lens both focus the light and aim it toward the back of the eye, where the retina is located.
- In the center of the retina is the macula. The macula is significant in receiving visual images. While the cornea does most of the focusing, the lens does the fine-tuning as the image is projected toward the retina.
- The retina sends electrical messages through the optic nerve to the visual cortex of the brain. The brain interprets the information and helps us identify what we see and how to respond.

People of all ages may experience the following conditions.

- Myopia or nearsightedness. The cornea and lens work together to make the viewed image come into clear focus at a point in front of the retina, so what the retina receives is a blurred image of items far away.
- Hyperopia, or farsightedness, occurs when the image hasn't quite come into focus when it gets to the retina.
- Astigmatism, unevenness in the cornea, means that the image viewed is distorted, sometimes in different areas in the field of vision.

Corrective lenses or LASIK surgery often help these conditions. LASIK, stands for Laser-Assisted In Situ Keratomileusis. During LASIK, the cornea is sliced open, then a laser is used to burn away small portions of the cornea and reshape it to reduce or eliminate image distortion. This is an increasing common surgery for people hoping to live without glasses or contact lenses.

At all ages, people may see floaters—small, shaded spots or lines that seem to drift past their vision, even when they hold their eyes still. Floaters are not uncommon nor a cause for concern unless many new floaters appear at once, or they are accompanied by what look like flashes of light, or there are areas of blindness in the sides of your visual field. Floaters, along with these additional symptoms, might indicate a detached retina or other serious eye problem. It requires the immediate attention of an eye care professional.

What Can We Expect from Our Vision as We Age?

As we age, almost everyone experiences some changes in vision. These include:

- Loss in the ability to focus on things close to us
- Small print becomes more difficult to see
- It takes longer to switch focus from something close to something far away

This is called presbyopia, which simply means “aging eyes.” It is a result of the lens in the eye becoming less flexible and the small, inner-eye muscles weakening.

- Peripheral, or side vision, reduces.

This is because muscles around the lens also weaken. We become less aware of people coming up beside us, cars in the lane next to us, or overhanging limbs and open cabinet doors that could be hazardous. Oregon DMV requires that drivers have at least 110 degrees peripheral vision. That means if you were standing in the middle of a clock and facing 12, you could see from the 10 on your left to the 2 on your right without turning your head.

- Yellowing of the lens of the eye.

A common result of prolonged exposure to light, especially sunlight, is a yellowing of the lens. The result is very much like looking through a yellow glass or sheet of cellophane.

Optional Activity: Distribute Strips of Yellow Cellophane.

Hold the yellow cellophane over your eyes. This simulates the effect of decades of exposure to light for your eyes.

Ask Participants

What differences do you notice when looking through the cellophane?

We have more difficulty seeing objects with little contrast to one another. It is harder to distinguish one dark color from another or to distinguish between very light colors at all. We see much less contrast when items aren't distinctly different colors; for example, black and navy blue. We are less likely to be able to see someone's facial expression to determine their mood, or read their lips to help us understand their words. We may miss where steps start if the edge is not marked clearly, or we may not be able to tell we are approaching uneven surfaces. People exposed during their lifetimes to more sunlight without protective glasses experience to a greater degree this yellowing and inability to distinguish contrasts and colors.

- More difficult to see in dim light.

Our pupils dilate more slowly and not as much as we age. As a result, less light enters our eyes. Seeing clearly when we are in a poorly lighted environment is a greater challenge. It makes driving at night or reading in dim light more difficult.

- Takes longer to adapt to changing light levels.

This means that when going from the well-lighted lobby into the darker movie theater, you need to pause longer than you did in the past before you can see where the empty seats are.

- More sensitive to glare.

Shiny magazine pages may be harder to read than “matte finished” pages.

All these changes occur gradually as we age. We seldom notice the changes from day to day or even year to year. Let’s take a moment and think about what we can do to compensate for these changes in vision.

Ask Participants

What can we do to compensate for:

- Reduced ability to see fine details?

Suggestions: Use glasses and/or a magnifying glass; get books and newspapers with larger print

- Reduced peripheral vision?

Suggestions: Turn head and eyes farther in each direction rather than rely on peripheral vision

- Loss of contrast sensitivity?

Suggestions: Use brighter lights, making certain they do not shine directly into your eyes; ask others for their perception of color; place small labels on shoes or clothes tags indicating which is navy blue and which is black

- Difficulty seeing in low light?

Suggestions: Leave lights on when you leave home or set lights on a timer so they are on when you return after dark; try not to drive at dusk or after dark; have your car’s headlights checked and replaced if they are not clean and bright; put the highest wattage bulbs recommended into light sockets in rooms you use frequently, especially for reading and hobbies; place the brightest lights available at your home’s entry and near any stairs, even if it is just a single step; prevent glare from lights by aiming the light at stairs, rather than into your eyes

- Slowed transition to different levels of light.

Suggestions: Allow greater distances between cars when driving; make a habit to pause when going into a room with different light levels

In addition to your annual vision check-up, it’s time to visit an eye care professional **if** you have difficulty:

- Reading the telephone directory or newspaper
- Writing checks
- Participating in hobbies you used to enjoy
- Reading street signs when driving
- Seeing expressions on people’s faces
- Walking without bumping into corners or tripping on curbs

Maintaining Good Eye Health

Several types of professionals can help us care for our eyes and protect our vision. Their job titles are included in the “Eye Care Vocabulary” in your packet. Take a few minutes now to try to match the vocabulary words to their correct definitions. Then we will see how you did.

Review correct answers to “Eye Care Vocabulary” (key is at the end of this Leader’s Guide).

You can do many things yourself to take care of your eyes.

Refer participants to the handout “Tips for Eye Care” from Lighthouse International.

Vision Disorders as We Age

As we age, not only do we face the normal changes in our vision, but the likelihood of more serious vision problems increases with each passing decade.

On a positive note, sight-threatening disorders can be treated, and further damage prevented, if they are detected and addressed early. It’s important to seek attention from your eye care professional **before** your vision is seriously damaged. Recognizing early warning signs and getting immediate help are critical to maintaining or restoring vision.

The four most common eye disorders of older adults are macular degeneration, glaucoma, cataracts, and diabetic retinopathy.

Refer participants to the handout “Common Vision Disorders.”

Age-related Macular Degeneration (AMD)

In the handout “Common Vision Disorders” point out the illustration of the effect of age-related macular degeneration (AMD).

Age-related macular degeneration (AMD) is the most common cause of vision loss in older adults. AMD is characterized by a blurring in the center of the field of vision due to deterioration of the macula, the center of the retina. When the macula deteriorates, it cannot receive the focused image from the cornea and lens and then transmit a clear signal to the brain for interpretation. The center of the image the person sees is blurred and darkened, and colors seem muted.

The causes of AMD are not well known. However, smoking and obesity seem to increase the risk for AMD. Women and whites seem to be at greater risk than men or African Americans. Some families have a higher risk of AMD.

In the handout “Eye Care Vocabulary,” refer participants to the Amsler grid.

People at risk for AMD are asked to look at an Amsler grid using one eye at a time. While focusing on the center dot, any waviness or distortion in the lines might indicate problems with the macula or retina—warranting further checking by an eye care professional. To look for symptoms of AMD, the eye care professional will dilate the pupils and then look into them at the macula with a magnifying lens to check for deterioration.

AMD comes in two forms, dry and wet.

- Dry AMD is by far the more common. It is the result of cells in the macula breaking down and causing blurred vision.
- Wet AMD is the result of new, abnormal blood vessels growing under the retina. They may leak blood and distort the retina. This form of AMD is a more serious condition and can cause permanent damage in a very short time. Dry AMD may progress into Wet AMD.

AMD vision damage cannot be reversed at this time, so early detection and treatment are essential to preserve your vision.

Laser surgery and photodynamic therapy show some success in slowing the progression of Wet AMD. Surgery uses lasers to destroy the new, abnormal blood vessels in the back of the eye. In photodynamic therapy, a drug that adheres to new blood vessels is injected into the eye. Then, bright lights are aimed into the eye to activate the drug, which then destroys the new blood vessels. Afterward, the eyes must be protected from light for several days. Results from both treatments may be temporary, and treatment might have to be repeated.

The National Eye Institute recommends taking a daily antioxidant and zinc supplement; they seem to slow the progression of AMD. Ask your eye care provider about antioxidant and zinc supplements if you experience AMD symptoms or have a family history of the disorder. Antioxidant and zinc supplement combinations for the treatment of AMD should be taken only under the supervision of your health care provider.

Glaucoma

In the handout “Common Vision Disorders,” point out the picture illustrating the effects of glaucoma.

Glaucoma is experienced as a loss of peripheral vision, which is the sight around the sides of the field of vision.

Glaucoma damages the optic nerve that carries messages from the eye to the brain. A common cause of damage to the optic nerve results from increased pressure, called intraocular pressure (IOP), inside the eye. However, some people with normal levels of IOP experience optic nerve damage as a result of an injury, a tumor, inflammation, diabetes, or use of steroids.

High intraocular pressure builds up when:

- Drainage canals in the eye become clogged
- Cells in the eye produce too much fluid

Eye examinations usually include a check of the pressure in the eye.

High IOP is treated with:

- Prescription medications, usually eye drops that are applied regularly throughout the day
- Laser surgery to open the drainage canals in the eye again
- If laser surgery is not successful, a conventional surgery may be tried

Sometimes marijuana is mentioned as a treatment for glaucoma. However, medical professionals generally consider its use ineffective.

Cataracts

In the handout “Common Vision Disorders,” point out the picture illustrating the effect of cataracts.

Cataracts are a clouding of the lens in the eye. Cataracts result when proteins in the lens of the eye clump together and harden, clouding the lens. The person with cataracts feels as if she’s looking through a brown fog.

Symptoms include:

- Blurred vision
- Glare from lights
- Inability to distinguish one color from another

Cataracts may develop in one or both eyes. Factors that contribute to cataracts include:

- Excessive exposure to sunlight
- Smoking
- High cholesterol
- Diabetes

The eye care professional will refer to the condition of the cataract—how clouded or solid it is— as its “ripeness.” The only treatment is to surgically remove the lens and replace it with a plastic lens. The timing of surgery depends on the condition of the cataract and how much the cataracts interfere with the person’s life.

There are two types of surgery:

- Extracapsular extraction. It has been used successfully for many years. It requires an incision at the edge of the cornea, removal and replacement of the lens, and small stitches to close the incision. The stitches are removed later.
- Phacoemulsification. This is a new method and is increasing in use. A small incision is made at the edge of cornea, the lens is vacuumed out, and an artificial lens is placed in the eye. This surgery generally requires no stitches.

Diabetic Retinopathy

In the handout “Common Vision Disorders,” point out the picture illustrating the effect of diabetic retinopathy.

Diabetic retinopathy is characterized by blurred vision and darkened spots that obscure portions of the field of vision.

Diabetic retinopathy is a common complication of long-term diabetes. Blood vessels in the back of the eye leak, distorting and damaging the retina so it cannot receive images projected by the cornea and lens. Laser surgery can stop some bleeding, if it not severe, but may result in the formation of scars that also might distort vision.

Preventing diabetic retinopathy is an important part of diabetes management. Maintaining healthy blood sugar levels and getting regular daily exercise helps to maintain overall physical health, including eye health.

Living with Low Vision

If you or someone you live with faces the challenge of living with low vision, here are some things you can do to improve the safety and convenience of your environment.

- Increase light levels. Make certain lighting is adequate in activity areas, such as the kitchen, and at entrances to the house.
- Control glare. Reduce shiny surfaces; make certain lamps and lights have shades that direct the light to the floor or work area rather than into your eyes.
- Mark edges. Place paint strips at the edges of stairs, sidewalks, or even a single step down into a living room or patio.
- Allow more time. Remember to pause when entering a room with a different light level, and to move slowly when navigating unknown or uneven ground.
- Add safety measures. Grab bars and stair rails on both sides of stairways can help a person steady himself if he misjudges the distance to the next step.
- Keep objects in the same place, so you don't have to search for them.
- Use low-vision aids. They range from telephones with large-print buttons to magnifying sheets to place over an entire page. Your lifestyle, interests, and specific details about your vision can help determine what equipment can help. Your vision care professional can help you locate the items.

Summary

Remember, some normal vision changes occur as we get older, but we should still be able to maintain healthy eyesight. The first step to eye care is a regular vision check-up with a qualified eye care professional. If your insurance coverage does not include vision care, contact your local office of Aging Services or your local Health Department. These are located in the Local Government pages of your phone book. They should be able to assist you in finding services.

If your eye care professional determines that no more can be done to correct or restore your vision, contact a low-vision rehabilitative service in your community. Your local Aging Services office or Health Department will be able to refer you to these. They can help you obtain training, equipment, and services to assist in your daily activities.

Evaluation

Distribute the "Informed consent statement" and evaluation form. Read aloud the "Informed consent statement" and give participants 5 minutes or so to complete the evaluation. Collect the evaluations and return them to your local county Extension office.

Thank you for your participation.

References

1. Oregon Division of Motor Vehicles, Vision standards.
http://arcweb.sos.state.or.us/rules/OARS_700/OAR_735/735_074.html
<http://www.odot.state.or.us/forms/dmv/24.pdf>
2. Anatomy of the Eye. www.ohsuhealth.com/cei/patient/cvcc_anatomy.asp
3. Review of Ophthalmology, December 2000, p. 36.

Resources for Further Information

Lighthouse International. www.lighthouse.org

“Tips for Eye Care,” reprinted with permission.

National Eye Institute, U.S. National Institutes of Health. www.nei.nih.gov/

“Anatomy of the Eye.”

Sensory Changes in Later Life, PNW 196. Pacific Northwest Extension Publication, available through your county Extension office or order via <http://eesc.oregonstate.edu/agcomwebfile/EdMat/orderform.html>.

Casey Eye Institute, Oregon Health and Science University. www.ohsucaseyeye.com/

Sight Council of America. http://www.checkyearly.com/s_check/

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Answers to “Eye Care Vocabulary”

Optician	Prepares and fits glasses based on a prescription
Optometrist	Examines eyes, checks vision, and looks for signs of disorders
Ophthalmologist	Physician who specializes in diseases and disorders of eyes
Presbyopia	Literally, “aging eyes”; loss of visual acuity
Macular degeneration	The center portion of the retina deteriorates
Glaucoma	High intraocular pressure damages optic nerve, reducing vision
Cataract	Clouding of the lens, due to protein clumps forming
Diabetic retinopathy	Blood vessels behind the retina break down and leak
Peripheral vision	View to the sides when the eye is looking forward
Intraocular pressure (IOP)	Determined by the amount of fluid in eyes
Amsler grid	A grid of straight lines used to determine vision problems
Phacoemulsification	Method of removing eye lens with cataract by suction



The Anatomy of the Eye

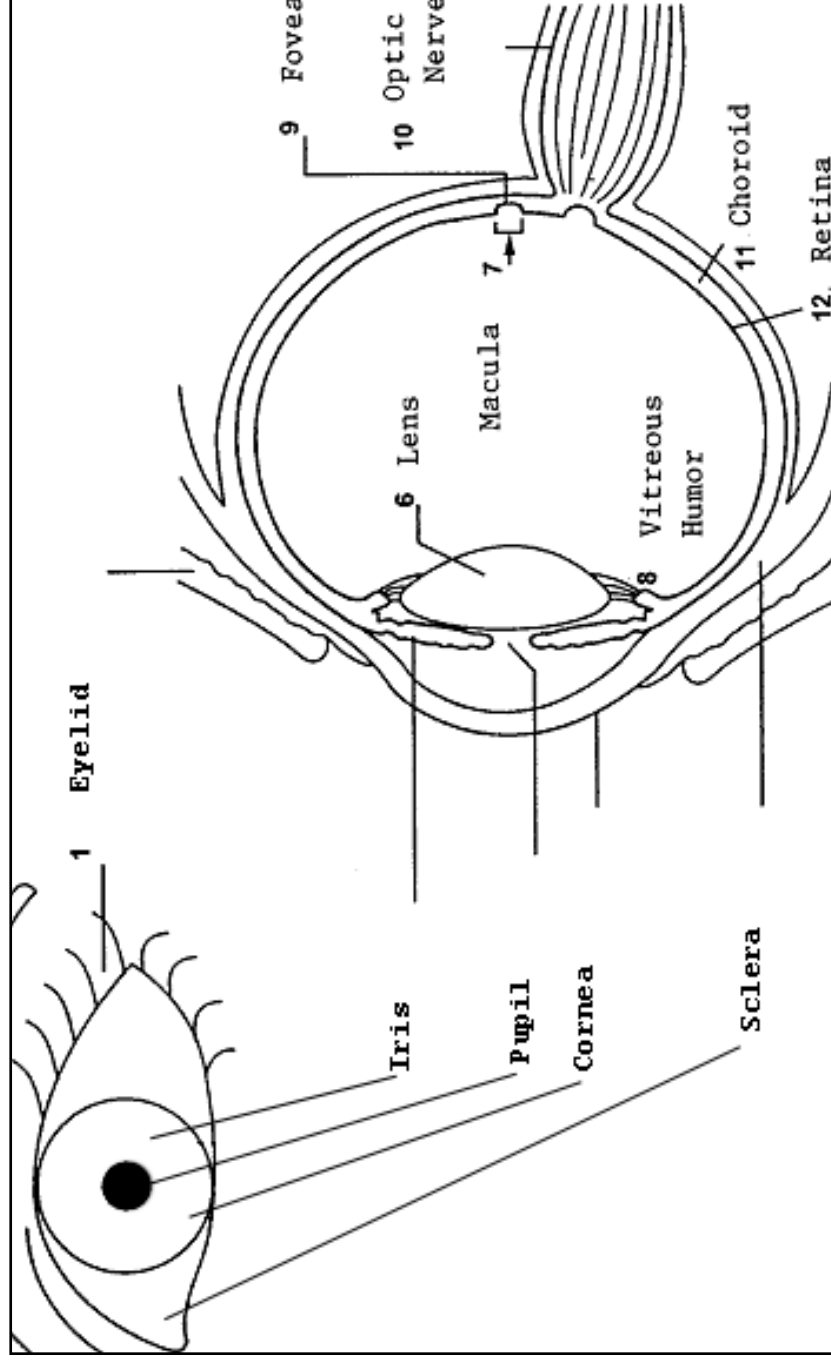
- ◆ **Choroid (KOR-oyd)**
A layer of blood vessels that feeds the retina.
- ◆ **Cornea (KOR-nee-uh)**
The clear outer part of the eye's focusing system located at the front of the eye.
- ◆ **Eyelid**
The skin-covered structure that protects the front of the eye; limits light entering the eye;

spreads tears over cornea.

- ◆ **Fovea (FOH-vee-uh)**
The center of the macula; gives the sharpest vision.
- ◆ **Iris**
The colored part of the eye; regulates the amount of light entering the eye.
- ◆ **Lens**
The clear part of the eye behind

the iris that helps to focus light on the retina. Allows the eye to focus on both far and near objects.

- ◆ **Macula (MAK-yoo-luh)**
The small sensitive area of retina that gives central vision; contains the fovea.
- ◆ **Optic nerve**
The bundle of over one million nerve fibers that carries visual messages from the retina to the brain.



- ◆ **Pupil**
The opening at the center of the iris. The iris adjusts the size of the pupil and controls the amount of light that can enter the eye.
- ◆ **Retina (RET-in-nuh)**
The light-sensitive tissue lining the back of the eyeball; sends electrical impulses to the brain.
- ◆ **Sclera (SKLEH-ruh)**
The tough, white outer coat of the eye.
- ◆ **Vitreous Humor (VIT-ree-us)**
The clear gel filling the inside of the eye.

**O R E G O N
F C E**

N O R M A L V I S I O N

A T T W E N T Y F E E T