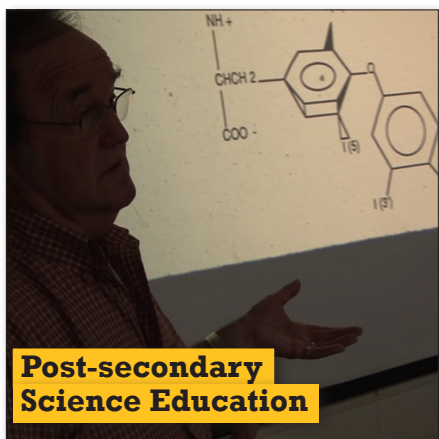




**Eye Care**



**Nursing**



**Post-secondary  
Science Education**

# RU↑4 the JOB?

## Careers in Eye Care Teacher Resource Guide



*This resource was made possible by a grant from eTech Ohio and the State of Ohio.*

# RU↑4 the JOB?

## Module Synopsis

Employment of optometrists is expected to grow much faster than the average for all occupations through 2018, in response to the vision care needs of a growing and aging population. (U.S. Department of Labor, Bureau of Labor Statistics).

Learn the nature of a job in optometry, as well as the training, and what other qualifications are needed in this career choice. Resources include Optometrist Career Guide, Your Eye-Q Test Activity Sheet, as well as career quiz, Should You Become an Optometrist?

## Terms

**Optometrics:** The science or practice of testing visual acuity and prescribing corrective lenses.

**Optometrist:** The health-care professional concerned especially with examining the eye for defects and faults of refraction, with prescribing correctional lenses or eye exercises, with diagnosing diseases of the eye, and with treating such diseases or referring them for treatment.

**Ophthalmologist:** The health-care professional who deals with the anatomy, physiology and diseases of the eye. They perform operations on eyes and are considered to be both surgical and medical specialists.

**Optician:** The person who makes and dispenses eyeglasses and other eye corrections. They do not perform medical tests.

**Dilation:** The action of stretching or enlarging an organ or part of the body

**Nearsightedness:** A vision condition in which close objects are seen clearly, but objects farther away appear blurred.

**Farsightedness:** A vision condition in which objects that are at a distance are clearer than those that are up close.

**Glaucoma:** An eye disorder in which the optic nerve suffers damage, permanently damaging vision in the affected eye(s) and progressing to complete blindness if untreated.

**Diagnose:** The identification of the nature and cause of anything.

# RU↑4 the JOB?

## Pre & Post Assessment

1. Which of the following statements is NOT true?
  - a. An optometrist is licensed to fit and dispense eye glasses
  - b. An optometrist is the primary eye care specialist.
  - c. An optometrist is the specialist who gives eye exams.
  - d. An optometrist can diagnose vision problems.
2. A person who goes into a career as an optometrist will need a good background in which of the following subjects?
  - a. History
  - b. Geography
  - c. Science
  - d. Language arts
3. A career in optometry involves which of the following?
  - a. Spending time with patients.
  - b. Grinding lenses for glasses.
  - c. Performing eye surgery.
  - d. A lot of travel.
4. What is the pay range for an Ohio optometrist just out of school?
  - a. \$15,000 - \$25,000
  - b. \$20,000 - \$30,000
  - c. \$40,00 - \$100,000
  - d. \$100,000 - \$150,000
5. What is the main reason optometry has changed in the last 10 years?
  - a. More people are going into the optometry
  - b. Advancements in medications and diagnosis
  - c. There are fewer optometry schools in the U.S.
  - d. Advertisements have let people know where to go for eye care.
6. What is one disadvantage to owning your own optometry practice?
  - a. You would have to work weekends.
  - b. You would have to work holidays.
  - c. You would have more paper work and administrative tasks to do.
  - d. You would have to go to more schooling.
7. What is one reason that the job outlook for a career in optometry looks good?
  - a. The United States government now requires men and women in the armed forces to get eye exams every 6 months.
  - b. Infants as young as 12-14 months of age can now wear glasses or contacts.
  - c. More colleges are offering degrees in optometry than in the last 10 years.
  - d. With the population of the United States aging, many more people will have vision problems.
8. What is one good way to determine if an optometry career is the right health care profession for you?
  - a. Look in college catalogs.
  - b. Talk to your best friend.
  - c. Talk with an optometrist.
  - d. Talk with your doctor.

9. Describe a typical day of an optometrist?

10. Describe the difference between an optician, optometrist and an ophthalmologist

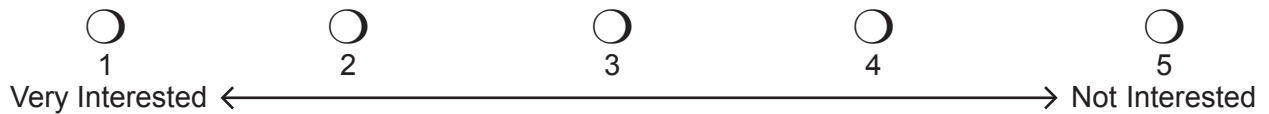
- Optician

- Optometrist

- Ophthalmologist

**Are YOU interested in a career in eye care?**

Some careers will be interesting to you and some may not. How interested are you in THIS career?



# RU↑4 the JOB?

## Pre & Post Assessment - Answer Key

- Which of the following statements is NOT true?
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  - An optometrist can diagnose vision problems.
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  - History
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  - Science*
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- A career in optometry involves which of the following?
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- What is one good way to determine if an optometry career is the right health care profession for you?
  - Look in college catalogs.
  - Talk to your best friend.
  - Talk with an optometrist.*
  - Talk with your doctor.

9. Describe a typical day of an optometrist?

*Answers will vary, but should include some of the following information.*

- *Examine people's eyes*
- *Test patients' vision*
- *Prescribe glasses and contacts*
- *Analyze test results and develop a plan*
- *Administer drugs to patients to aid in the diagnosis of vision problems and prescribe drugs to treat some diseases*
- *Provide postoperative care to patients*

10. Describe the difference between an optician, optometrist and an ophthalmologist

- Optician
  - o *Dispenses glasses*
  - o *Trained to grind and fabricate lenses*
- Optometrist
  - o *Primary eye care practitioner*
  - o *Gives eye exams*
  - o *Prescribe medications to treat most eye diseases*
- Ophthalmologist
  - o *Specialize in medical and surgical eye care*
  - o *Prescribe glasses and contact lenses*
  - o *Can diagnose vision problems and eye diseases, prescribe medications to treat most eye diseases*

# RU↑4 the JOB?

## Activity 1

### Depth Perception

Two eyes are better than one, especially when it comes to depth perception. Depth perception is the ability to judge objects that are nearer or farther than others. To demonstrate the difference of using one vs. two eyes to judge depth hold the ends a pencil, one in each hand. Hold them either vertically or horizontally facing each other at arms-length from your body. With one eye closed, try to touch the end of the pencils together. Now try with two eyes; it should be much easier. This is because each eye looks at the image from a different angle. This experiment can also be done with your fingers, but pencils make the effect a bit more dramatic.

#### **Materials:**

- Pencils (but your fingers make a good substitute)

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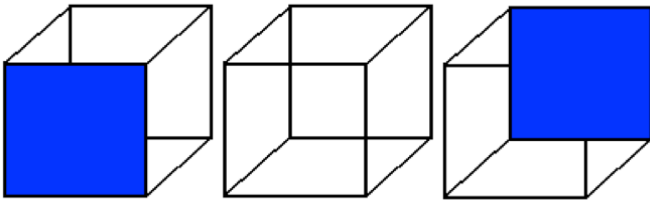
## Activity 2

### Visual Illusions

What you see is not always what is there. Or is it? The eye can play tricks on the brain. Here are several illusions that demonstrate this point.

#### 2A. The Magic Cube

Look at the center cube.



What side is the front? \_\_\_\_\_

Is the front as shown on the cube on the right side or is the front as shown on the cube on the left side or is there no front at all?

\_\_\_\_\_

#### 3B. Muller-Lyer Illusion

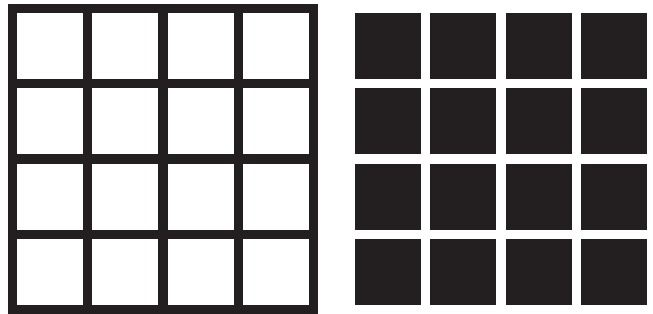
Which of the lines shown below is longer?

\_\_\_\_\_



#### 2C. Grid Illusion

Stare at the middle of picture with black squares 15-30 seconds.



Are those really dots that appear at the corners of the squares?

\_\_\_\_\_

What happens if you focus on a dot?

\_\_\_\_\_

Now look at the middle of the picture with the white squares.

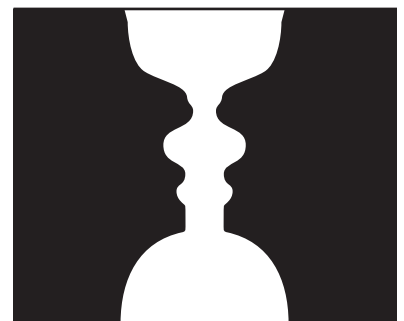
Do you see dots again? \_\_\_\_\_

What color are they? \_\_\_\_\_

#### 2D. Face or vase?

Do you see a vase or a face in the figure below?

\_\_\_\_\_







### Activity 3

#### **Optician, Optometrist or Ophthalmologist. Is this career for me?**

Use the resources and websites listed in the Resource Guide, as well as other resources, to explore and analyze your reasons for determining which career, optician, optometrist or ophthalmologist, would be best suited for your abilities, talents and desired income level.

Include educational requirements and graph to interpret median income levels of these occupations in your state, town or country. Graph and interpret median income levels of the various occupations in your state, town or county.

Please cite your references including source, author and date of publication.

Be prepared to present your information to a larger group.



## Activities - Answer Key

### 1. Depth Perception

*Answers will vary.*

<http://faculty.washington.edu/chudler/chvision.html> (From Neuroscience for Kids)

### 2. Visual Illusions

#### 2A. Magic Cube

Which side is the front? *Answers will vary.*

Which side is the front or the cube on the right & left? *Answers will vary.*

#### 2B. Muller-Lyer Illusion

*The same. Have your students measure them. We see the lines as different because we have been “taught” to use specific shapes and angles to tell us about size.*

#### 2C. Grid Illusion

Dots on corners: *No*

All other questions: *Answers will vary*

#### 2D. Face or vase

*Answers will vary.*

*This type of picture was first illustrated by psychologist Edgar Rubin in 1915. Notice that it is very difficult to see both the faces and the vase at the same time. This may happen because we tend to focus our attention on only one part of the image...either the faces or the vase.*

<http://faculty.washington.edu/chudler/chvision.html> (From Neuroscience for Kids)

<http://www.hhmi.org/bulletin/pdf/june2003/Illusions.pdf> (Optical Illusions, Why We See the Way We Do)

<http://library.thinkquest.org/J0110336/together.htm> (Projects by Students for Students)

### 3. Optician, Optometrist or Ophthalmologist. Is this career for me?

*Answers will vary.*

*This activity could be done by an individual student, or by small groups working together to gather and interpret information.*

[http://healthguideusa.org/careers/optometrist\\_earnings.htm](http://healthguideusa.org/careers/optometrist_earnings.htm) (Health Guide USA – Optometrist)

<http://www.bls.gov/home.htm> (Bureau of Labor and Statistics – Ophthalmologist)

<http://library.thinkquest.org/15569/car1bop2.html> (Projects by Students for Students – Ophthalmologist)

<http://library.thinkquest.org/15569/car1bop5.html> (Projects by Students for Students – Optometrist)

<http://library.thinkquest.org/15569/car1bop4.html> (Projects by Students for Students – Optician)

<http://quickfacts.census.gov/qfd/index.html> (U.S. Census Bureau)

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## Resources

### American Optometric Association (AOA)

<http://www.aoa.org/>

The American Optometric Association (AOA) is a federation of state, student and armed forces optometric associations. Through these affiliations, the AOA serves members consisting of optometrists, students of optometry, paraoptometric assistants and technicians.

### Bureau of Labor and Statistics – Ophthalmologist

<http://www.bls.gov/home.htm>

### Health Guide USA – Optometrist

[http://healthguideusa.org/careers/optometrist\\_earnings.htm](http://healthguideusa.org/careers/optometrist_earnings.htm)

### How do I choose among the different types of eye doctors?

[http://vision.about.com/od/choosinganeyedoctor/f/eye\\_specialist.htm](http://vision.about.com/od/choosinganeyedoctor/f/eye_specialist.htm)

- Ophthalmologist are eye doctors known as either a Medical Doctor (M.D.) or Doctor of Osteopathy (D.O.) who specialize in medical and surgical eye care.
- Optometrists are eye doctors with a Doctor of Optometry (O.D.) degree and are the main primary eye care practitioners.
- Although not eye doctors, opticians are eye care professionals who can dispense, adjust and repair eyeglasses.

### Light 3: All Those Seeing Color, Say Eye!

<http://www.sciencenetlinks.com/lessons.php?DocID=181>

To introduce the roles of the eye and brain in the perception of objects, including color. This maybe related to how the brain and eye work together to see optical illusions.

### Optometry: A Career Guide

[http://www.opted.org/files/public/Eyes\\_Have\\_it\\_Career\\_Guide\\_-\\_FINAL\\_02\\_10.pdf](http://www.opted.org/files/public/Eyes_Have_it_Career_Guide_-_FINAL_02_10.pdf)

This guide was written and compiled by the Association of Schools and Colleges of Optometry (ASCO) Recruitment Materials Task Force. This document was written so that it could represent the most current, consistent, and reliable information on optometry as a career for use by prospective students, prehealth advisors, and optometrists who want to share information about their profession with others.

### Optometrist Career Information

<http://careerplanning.about.com/od/occupations/p/optometrist.htm>

From About.com Career Planning. Includes information about a career in optometry.

### Occupational Outlook Handbook, 2010-11 Edition

<http://www.bls.gov/oco/ocos073.htm>

From Bureau of Labor Statistics. Includes information about careers in optometry.

### Should You Become an Optometrist? – Career Quiz

[http://careerplanning.about.com/od/occupations/a/optometrist\\_quiz\\_intro.htm](http://careerplanning.about.com/od/occupations/a/optometrist_quiz_intro.htm)

Are you considering becoming an optometrist? This quiz will help you find out if you have the personal characteristics you need to have a career as an optometrist.

### **Science Net Links**

<http://www.sciencenetlinks.com/lessons>

Science Net Links has several lessons for Grades 6-8 which explore the nature of sight and can be related directly to learning about what Eye Care Professionals do.

### **Seeing into the Future**

<http://search.ebscohost.com/login.aspx?direct=true&db=nfh&AN=200604011056488321&site=src-live>

Rosendorff, D. Herald Sun (Melbourne. Retrieved from Ebsco Host Student Research Center.

Article describes what a career in optometry is like. There are new developments all the time and eye-testing is becoming much more technologically advanced. Two newer advances are listed below.

- Retinal cameras, which take photos of the retina
- Corneal topographers, which map the corneal surface

Most vision problems are caused by refractive errors -- that is, the optics of the eye are out of focus. Also, most optometrists are now allowed to prescribe certain medications.

### **ThinkQuest Website**

<http://library.thinkquest.org/15569/car1bop4.html>

Projects by Students for Students – Optometrist

<http://library.thinkquest.org/15569/car1bop2.html>

Projects by Students for Students – Ophthalmologist

### **Your Eye-Q Test Activity Sheet**

<http://www.aoa.org/x6035.xml>

From the American Optometric Association. Twenty T/F question designed to give you an idea of how well you understand your eyes.



## Common Core State Standards for Eye Careers

### Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

#### College and Career Readiness Anchor Standards for Writing:

1. Write arguments focused on discipline-specific content.

**WHST.11-12.1.a.** Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.

2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

**WHST.11-12.2.d.** Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.

### Reading Standards for Literacy in Science and Technical Subjects 6–12

#### Craft and Structure - RST.6-8.4

4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

#### Integration of Knowledge and Ideas - RST.6-8.9

9. Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources.

### Common Core State Standards for Mathematics

#### Statistics and Probability - 7.SP.3

Draw informal comparative inferences about two populations.

3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.

#### Geometry - 8.G.2

Understand congruence and similarity using physical models, transparencies, or geometry software.

2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

### **Model with Mathematics - N-Q.2**

Define appropriate quantities for the purpose of descriptive modeling.

2. Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol.