LESSON
1

Name _____ Date _____

The Eye and How We See

Label the parts of the eye. Some options are used more than once.

A. PUPIL – the black circle in the center of the iris that lets light enter the eye. The pupils get bigger and smaller to allow different amounts of light into the eye.

B. IRIS – the colored part of the eye that controls the size of the pupil.

C. CORNEA – the clear covering that protects the iris and pupil.

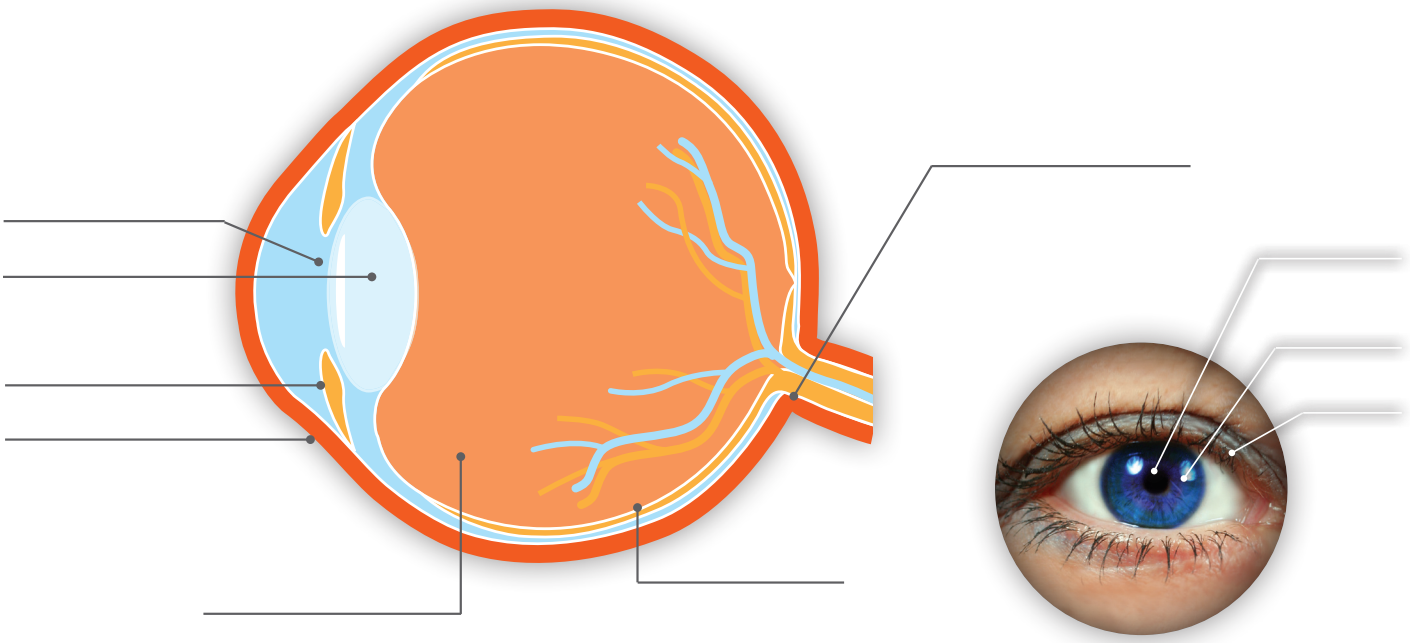
D. EYELID & EYELASHES – protect the eyes. Blinking spreads tear fluid over the eyes to prevent them from drying out.

E. LENS – Sits behind the pupil. It focuses light that comes into the eye to form an image on the retina.

F. VITREOUS BODY – the colorless, gelatin-like material that fills the eyeball between the lens and the retina.

G. RETINA – sits at the back of the eye and is made up of light-sensitive cells. The image that the retina receives is actually upside down. The retina sends the image to the brain, which flips the image right-side up, allowing us to see.

H. OPTIC NERVE – carries messages from the retina to the brain.



LESSON
2

Name _____ Date _____

Refractive Errors

Draw a line from the refractive error to the picture it matches.

1. 20/20 VISION

2. HYPEROPIA

3. MYOPIA

4. ASTIGMATISM

5. BLINDNESS

LESSON
2

Name _____ Date _____

Refractive Errors

Write the definition of each refractive error on the lines provided.

1. 20/20 VISION

2. HYPEROPIA

3. MYOPIA

4. ASTIGMATISM

5. BLINDNESS

LESSON 3

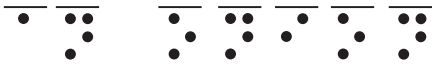
Name _____ Date _____

Braille

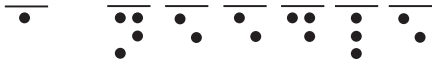
Use the Braille alphabet chart below to decipher the answers to the riddles.

1. What has eyes but no nose, a tongue but no teeth and is a foot long?

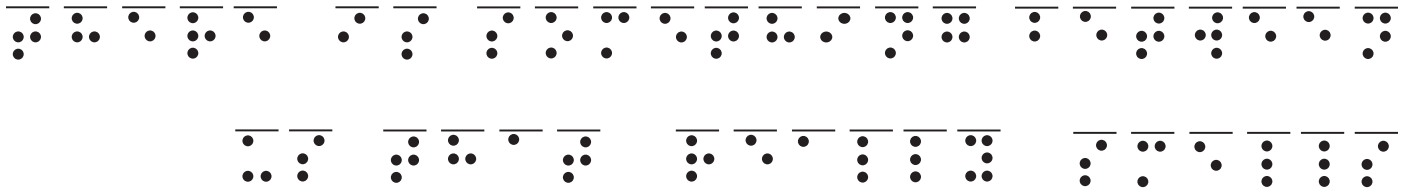
2. If you cut me, I won't cry but you will cry. What am I?

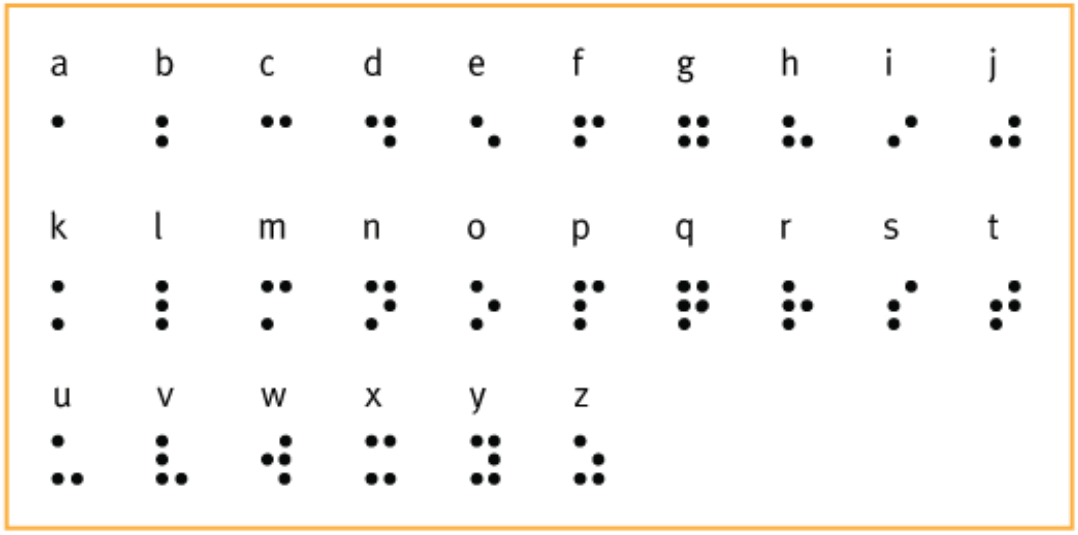


3. I have an eye, but I cannot see. What am I?



4. What did one eye say to the other eye?





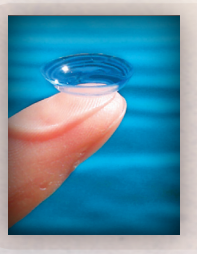
LESSON
4

Name _____ Date _____

Seeing into the Past

Late 13th Century:
The first eyeglasses were invented in Italy.

Early 17th Century:
The first graded lenses of varying strength were invented in Spain, allowing people to select different lenses based on their particular vision problem.



1936:
Dr. WIlliam Feinbloom introduces plastic contact lenses that are more flexible and lightweight.

0

1000

1400

1600

1700

1750

1800

1900

1950

2012

60 A.D.:
Roman Emperor Nero wears lenses made of emerald to view the gladiator games.

1000 A.D.:
An early version of the magnifying glass called a "reading stone" is developed.

1730:
London optician Edward Scarlett adds sidepieces to frames, allowing them to rest atop the ears.

1966:
The first photochromic lenses are introduced.

LESSON 4

Name _____ Date _____

Seeing into the Past

Circle the correct answers to test how much you know about "Seeing Into the Past."

1. **Roman Emperor Nero viewed the Gladiator games through lenses. Which gem was used to make these lenses?**

   Ruby Emerald Diamond Sapphire

2. **Although historians have pinpointed the late 13th century as the likely time spectacles were first invented they don't know who the inventor was, just his nationality. Which nationality was he?**

   English French German Italian

3. **Counterfeiting or "lens bait and switch" has been going on since the 14th century. Which lens material was substituted for the more valuable rock crystal?**

   Diamonds Glass Plastic Lead

4. **In the 14th century, eyeglasses were an extravagant statement of wealth and power. Which class of people were not among the privileged to benefit from the use of spectacles?**

   Clergymen Noblemen Royalty Blacksmiths

5. **What invention spurred the wide use of reading glasses?**

   Weaving Machines Gutenberg's Printing Press Glass Blowing Dyecasting

6. **Determining the right lens for the given eyeglass wearer was an arduous task. In the early 17th century the first graded lenses were invented. What nationality were the inventors?**

   Italian German French Spanish

7. **Historical sources indicate that the concept of combining both distance and near lenses into one set of eyeglasses was invented around 1775. Who was the likely first inventor?**

   Benjamin Franklin Henry Morse Samuel Pierce Thomas Mann

8. **Which U.S. President created a major public relations coup for an Ophthalmologist whose waiting room became packed with wanna-be patients as a result?**

   Andrew Jackson George Washington Thomas Jefferson Samuel Adams

9. **Which invention, in 1926, created as much a need for distance-seeing eyeglasses as the Gutenberg Printing Press had for reading or close-up seeing spectacles 470 years earlier?**

   Telephone Television Movie Camera Automobiles

10. **The U.S. Food and Drug Administration instituted the industry's first test mandating that all eyeglass lenses pass a minimum level of shatter-resistance to insure public eye safety. What was that test called?**

    Spectroscopy Crash Testing Drop Ball Test Thermoanalysis

LESSON 4

Name _____ Date _____

How to Make a Timeline

Plot History on a Line.

1. Decide what the timeline will show: personal events, big political events, events related to a geographic area, randomly chosen events, and so on. How will you choose which events to include and exclude?

2. Make a list of events that you wish to put on your timeline.

3. Research and note the specific dates when the events that you wish to include occurred. It is a good idea to note your source(s), too, so that you can return later and verify the dates, if necessary.

4. List the events in a chronology, a sequence of earliest to latest.

5. What are the earliest and latest dates that you wish to include.

1735, 1812

6. Choose the period of time that your timeline will cover, being sure to include your earliest and latest dates.

1700 – 1850

7. Decide what units of time you will use (days, months, years, decades, centuries, etc.) to divide your timeline into segments. These decisions may be a matter of trial and error, based on the size of your paper.

Decades

8. Calculate the number of segments that your timeline will have.

1700 to 1850 =
150 years/10 years =
15 segments

9. Draw a line and divide it into the number of equal segments that you figure you will need.

10. Label the dates on the appropriate segments, left to right

11. Using the chronology that you made of events and dates, figure out where they would fall on your timeline. How will you mark and label them? For instance, you could write on the timeline, attach colored labels, or make a code that refers back to your chronology.

ONE TIMELINE FOR LOCAL EVENTS AND ONE FOR WORLD EVENTS

12. If there is not room on your timeline to include all of your chronology, cull some of the dates or make a timeline with larger segments that leave more room.

13. If your dates can be divided into two or three smaller categories or themes, try making parallel timelines with identical segment sizes. Then you can see how the theme developed, but you can also compare two or more themes at a time.

LESSON 5

Name _____ Date _____

Eye Hazards

Answer the following questions about ultraviolet (UV) radiation:

1. How does the sun help regulate life on Earth?

_____

_____

2. What is UV radiation?

_____

3. What effect do UV rays have on our skin and eyes?

_____

_____

_____

4. Do we need to worry about UV rays on cloudy days? Why or why not?

_____

_____

5. List three things you can do to protect your skin and eyes from UV rays.

_____

_____

_____

_____

Eyes at Work

Think about the activities you participate in every day. Are you doing all you can to protect your eyes as you do them? For each situation listed below, write one way that you could protect your eyes.

On the tennis court:

_____

Outside at recess on a sunny day:

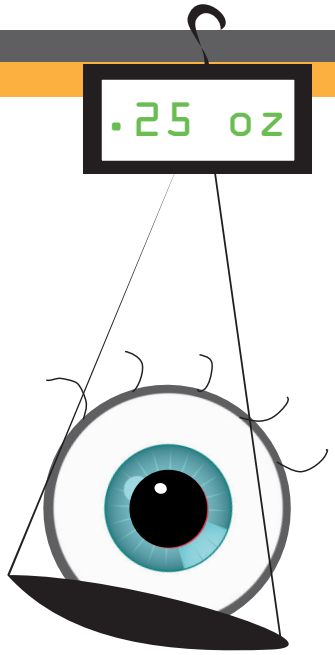
_____

In the pool:

_____

Name _____ Date _____

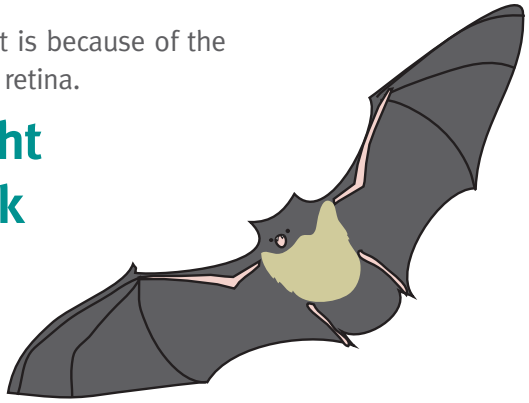
Fun Facts About Eyes



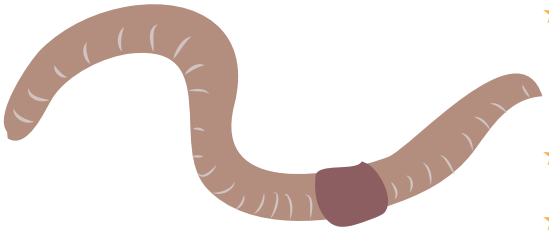
The eye weighs about 1/4 ounce

- ★ The eye measures less than 1 inch in diameter.
- ★ During a blink, the eye is closed 0.3 seconds. This equates to 30 minutes each day.
- ★ We blink approximately 10,000 times per day.
- ★ One in every 12 males in color blind.
- ★ When people have red eyes in photographs, it is because of the light that reflects off the blood vessels of the retina.

Some bats have poor eyesight and use their hearing to track insects and avoid obstacles.



- ★ The American Woodcock could see all bases, the home plate, the entire outfield, the entire stadium, and an overhead dome from the pitcher's mound without moving its head.



- ★ Alligators and most birds have three eyelids.

Earthworms are blind

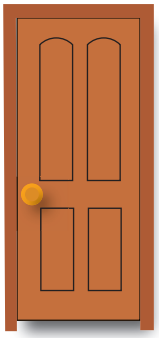
- ★ Eagles cans see a mouse one mile away.
- ★ Jumping spiders have eight eyes.
- ★ Owl eyes fill over half of its skull, and an owl can rotate its neck 270 degrees.
- ★ Flying insects can see up to 360 images a second during daylight, whereas the human eye processes approximately 60.
- ★ Fish sleep with their eyes open.
- ★ Some worms have more than 100 eyes.

Starfish eyes are on its feet.

Name _____ Date _____

When You Meet a Person Who is Blind

- ★ Treat me as you would anyone else. I do the same things as you do, but sometimes use different techniques.
- ★ Speak in a normal tone of voice. Blindness doesn't equal hearing loss.



- ★ Talk directly to me, not to my companion. Loss of sight is not loss of intellect.
- ★ When entering a room, identify yourself; when exiting, be sure to mention that you are leaving.
- ★ Address me by name so I will know you are speaking to me.
- ★ If you leave me alone in an unfamiliar area, consider offering me an orientation clue, such as: 'The door is to your left.'
- ★ Don't worry about using common, everyday words and phrases like "look," "see" or "watching TV" around me.
- ★ If I look as though I may need assistance, ask. I'll tell you if I do. If I am about to encounter a dangerous situation, voice your concerns in a calm and clear manner.

- ★ Pulling or steering me is awkward and confusing – it's really not helpful. Avoid grabbing my arm, and please don't touch my dog's harness.
- ★ Ask, "Would you like me to guide you?" Offering your elbow is an effective and dignified way to lead someone who is blind. Do not be afraid to identify yourself as an inexperienced sighted guide and ask for tips on how to improve. Using audible cues, such as a tap or pat on an object (such as a chair or doorway), is a good technique for showing me their location. Commenting, 'Here's the chair,' while tapping on it helps me to quickly locate it.
- ★ Be considerate. If you notice a spot or stain on my clothing, tell me privately (just as you would like to be told).

- ★ Be sure to give useful directions. Phrases such as "across the street" and "left at the next corner" are more helpful than vague descriptions like "over there."
- ★ In a restaurant, give clear directions to available seats. Your offer to read the menu aloud may be appreciated, but you shouldn't assume I would not want to order my own food.
- ★ Offer to let me know what is on the table: ketchup bottle, water glasses, salt and pepper shakers, etc. You can describe the location of items by using clock positions: "Your coffee is at 6 o'clock"; "The sugar is at 1 o'clock."
- ★ Leave doors all the way open or all the way closed – half-open doors or cupboards are dangerous. And more often than not, moving chairs or other objects around – especially in a familiar environment – winds up being more confusing for me than helpful.
- ★ Be sensitive when questioning me about my blindness. This is personal information and boundaries should be respected.