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How much do you know about eye safety? Take this sample quiz to find out:

Eye injuries are:

- a. Common**
- b. Painful**
- c. Expensive to treat**
- d. A threat to the economy**
- e. Disabling**
- f. Preventable**
- g. Potentially fatal**
- h. All of the above**

The answer is ***h***.

According to the American Academy of Ophthalmology, more than 2.5 million eye injuries occur in the United States each year. Eye injuries are usually painful, as the eyelid is covered by the thinnest skin in the body. Additionally, eye injuries threaten productivity, and can be permanently disabling or fatal. Thankfully, most injuries are likely preventable by taking safety precautions such as wearing protective eyewear.

Our gift of vision comes at a cost—the eye is not well protected. The eye, which is only protected by the eyelid, is the only moist surface in the body that is continuously exposed to the environment. This means that injury from foreign objects, chemicals, radiation, severe heat and infectious agents are particularly concerning for the eye.

Objects that approach faster than a person can blink can severely hurt the eye. Recognizing that the eyelid can cover the surface of the eye in $3/10^{\text{th}}$ s of a second, these objects will likely be moving very fast, and faster objects have more damaging energy to impart to the eye.

Other than danger from inhalation, chemicals in solid or gas form are less likely to cause damage than those in liquid form. Liquids are less damaging because they can spread over a surface while chemicals need a fluid environment to react. Because the surface of the eye is covered in liquid tear film, any chemical suddenly takes on a liquid form when it hits the eye and can cause an instantly damaging chemical reaction. Chemicals can also cause a delayed reaction, like an allergy, that can make an eye very uncomfortable, reduce vision, and even cause permanent harm.

Clothing can block most natural forms of radiation, particularly Ultraviolet (UV) rays from the sun. However, the eye is normally “unclothed!” While solar radiation usually does not penetrate the skin and takes some time to cause sunburn, the intense brightness of the sun can cause almost immediate damage to the retina, the neurologic tissue lining the back of the eye that converts light energy into signals that

can be seen by the brain. In addition to damage caused by the sun, very weak lasers that cause no harm to any other part of the body can cause sight-threatening burns to the retina.

Heat severe enough to melt glass might not cause any harm to someone who is not in direct contact with the source of heat. However, the cornea is susceptible to surface damage in these situations. Long-term exposure to high temperatures could cause cataract, a clouding of the natural lens within the eye.

Most germs need a moist environment to attach to the cells of the body and cause harm. The moist surface of the eye is surprisingly well protected. A blink mechanically washes away germs, the tear film coating the eye naturally contains germ-killing chemicals, and the intact corneal surface provides a remarkable barrier to invasion by disease-causing germs. An eye with an unhealthy tear film, weak or infrequent blink, or damaged corneal surface is hampered in fighting infections. Additionally, some germs such as the virus that causes the common cold, are particularly equipped to enter the body through the eye. The best way to protect the eye is to prevent noxious substances from ever reaching it. The best safety goggles are those made of polycarbonate, with tinting or coatings to block UV radiation. If worn by those who need them, U.S. eye injuries would be reduced by 90 percent. Incorporating these lenses into face shields and face masks that form a good seal would prevent exposure to chemical and biological agents and objects such as shrapnel or particles caused by explosions. In addition to protecting the individual, environmental controls and safety-oriented processes would help reduce the risk of eye injury. These controls and processes include shielding machinery which spray or eject chemicals or debris, offering masks for patients who cough or sneeze, and ensuring that proper hand-washing is practiced. Eye injuries matter to everyone and have an impact upon us all.

Everyone needs eye protection at some time and should recognize when these risks occur. We should encourage our colleagues, friends and families to protect their eyes, recognizing that most eye injuries occur at home. Employers and employees need to assess workspaces and job functions for potential eye injury risks and ensure that compliance with safety standards is maintained. Students and teachers need to understand that behaviors that might seem as simply annoying or disruptive such as using straws or rubber bands to popel objects could cause tragic results. All of us can make a difference, one eye at a time.