Content Area: Vision Care I

Unit #1 – Ocular Structure and Lenses

Unit overview: Scholars will learn the structure of the human eye and the imperfections that go along with it. Scholars will learn about the structure of the eye, how eyeglasses help improve the sight of patients, and how to measure the power of lenses in diopters.

Stage 1 Desired Results

Mission/Vision alignment

- **Tenacious:** Recognizes and takes advantage of opportunities to discover passions
- **Think Purposeful:** Thinks creatively to solve problems, make decisions, and take action
- **Advocate:** Accepts differences and listens to the voice of others

Transfer

Scholars will be able to independently use their learning to…

Discuss many of the biological components that are required for eyes to function, and describe how light and images reach the brain through the eyes, in order to understand how glasses correct vision and be able to help someone understand their vision needs

Recognize that every individual is different and have different prescriptions to correct ocular issues, and they will need different types of glasses to correct vision to help a student see the board

Analyze, synthesize and integrate technical knowledge, skills and understandings in a constantly evolving world to be a literate consumer of electronics and optics

Meaning

CDOS Standards (Career Development and Occupational Studies):
1, 2, 3a, and 3b

CCTC Standards (Common Career Technical Core)
1, 2, 4, 8, 9, 11

ESTABLISHED GOALS

1. Describe the structure and functions of the human eye
2. Explain how diseases and deformities of the eye affect vision

Understand how lenses correct vision imperfections

UNDERSTANDINGS

Scholars will understand that…

1. *The curvature of the crystalline lens of the eye focuses images on the retina of the eye*
2. *Changes to the cornea and crystalline lens of the eye affect the ability to see*
3. *Myopic eyes are near-sighted and can be corrected with minus lenses; hyperopic eyes are far-sighted and can be corrected with plus lenses.*
4. *Astigmatism is a natural disorder of the eye that causes vision issues and can be corrected with "cylinder" in prescription eye glasses*
5. *Spherical lenses don't correct astigmatism, but correct refractive imperfections of the eye*
6. *Images focus through the pupil and onto the retina where the light rays are collected and sent to the brain for visual processing*
7. *Concave and convex lenses refract light differently*

ESSENTIAL QUESTIONS

1. How does my eye make an image?
2. Why can't I see like other people?
3. How do glasses help to correct my vision?

	Acquisition	
	Scholars will know… 1. *What myopia, hyperopia, and astigmatism are* 2. *How the cornea, crystalline lens, retina, pupil, and iris work together to generate images for the vision center of the brain* 3. *How lenses correct vision imperfections* 4. *How specific types of lenses bend light*	*Scholars will be skilled at…* 1. *Describing how convex and concave lenses will refract light* 2. *Describing how images are formed in the human eye* 3. *Using mm's to measure sizes and distances* 4. *Recognizing and discussing the different aspects of the mammalian eye that are critical for sight* 5. *Understanding how the pupil regulates light entrance to the eye* 6. *Describing how lens accommodation functions*

Stage 2 - Evidence

Evaluative Criteria	**Assessment Evidence**
Knowledge of the structure of human eye. Demonstrate simple myopia and simple hyperopia using a model of the eye	PERFORMANCE TASK(S): Scholars will demonstrate how the mammalian ocular system projects images on the back of the eye using models. Through manipulation of models, students will demonstrate to the teacher how eyes work correctly as well as how misshapen eyes project images. Scholars will use available lenses to correct vision issues, demonstrating an understanding of how light passes through concave and convex lenses.
	OTHER EVIDENCE: Labeling of components of cow eye during dissection Quizzes Questioning Reflections completed by student

Stage 3 – Learning Plan

Summary of Key Learning Events and Instruction

1. Take Scholars on a tour of the shop – making a pair of prescription glasses in front of them. (*Where and Why, Hook*)
2. Lasers and lenses – learn how different shaped lenses bend light and how different concave (or convex) lenses bend light more or less. Learn the ray differences between concave and convex lenses. (*Hook, Equip, Rethink*)
3. Focal length and diopter measurement – discover the effect of moving lens on the position of an image. (will be able to apply to changing shape of crystalline lens for accommodation of eye at later date.) (*Hook, Equip, Rethink*)
4. Eye activities (LP2) – Optical illusions and functions of eye. How do the different components of the eye work and how do these piece fit together to create a visual field. (*Hook, equip, organized, tailored)*
5. Eye activities – learn the structure and function of the different components of the eye. How do they work and what is their job for the overall vision of a person.
    a. Complete simple and more complex diagram labeling of the parts of the eye (*Hook, Equip, Rethink*)
    b. Use eye models to take apart the eye and learn the names of all the parts (*Equip, Rethink, revise)*
    c. Cow eye dissection (*Equip, rethink, organized, exhibit)*

6. Eye imperfections – names and effects. Learn how different shapes of an eye can affect patient's ability to see. Learn these and what to do for the eye to correct vision – notes, videos, and discussion will be used (*Equip, Organized, Rethink*)
7. Demonstrate understanding of how the components of the eye work together by using available models to project images on the back of a model eye for emmetropic eyes, hyperopia, and myopia *(Organized, tailored, rethink, equip)*