

The Human Eyes



“The eye is like a mirror, and the visible object is like the thing reflected in the mirror.”-- Avicenna, early 11th century

Close your eyes and think about what life would be like without vision. You are in absolute darkness now. How do you feel?

Hopefully you just realized how precious your eyes are. Your eyes are like windows onto the world. We depend on our eyes to see, to read and to navigate our way around. Through our eyes, we can appreciate countless shapes and colors. We get to see all kinds of wonderful things like the sky, the sea, trees, animals and birds. We can recognize our family, friends and loved ones.

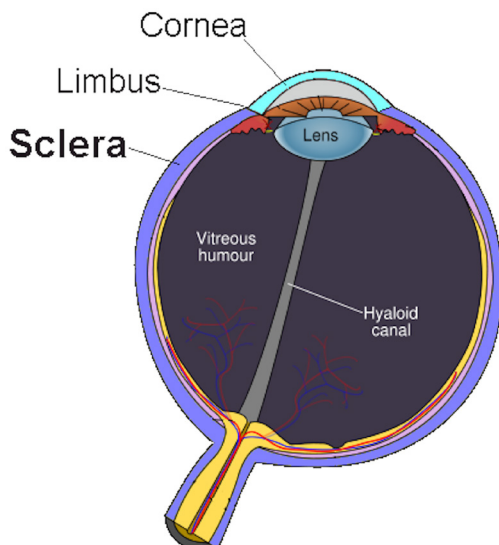
Have you ever wondered how your eyes work? Have you ever wondered how the sunlight enters the eyes to help you see? Let’s start our multi-dimensional journey into the amazing eyes.

First Dimension : Analytical Thinking

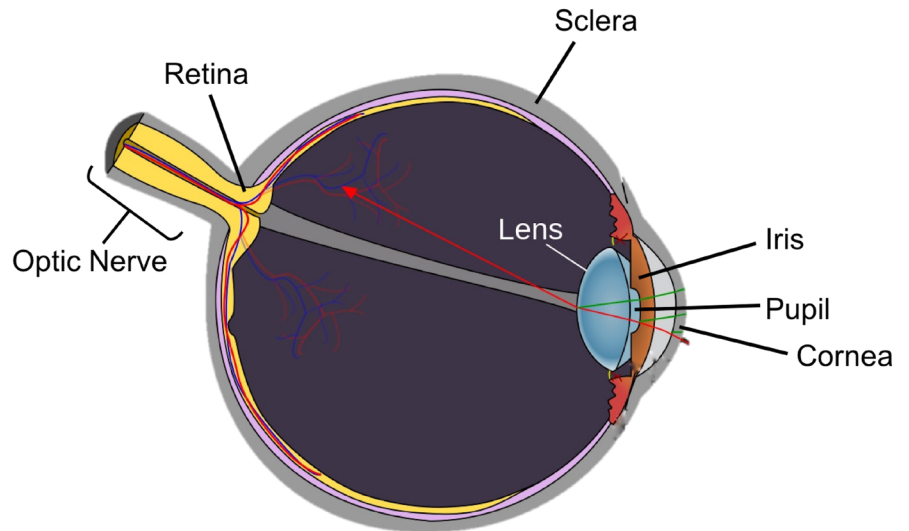
SCIENTIFIC UNDERSTANDING OF THE HUMAN EYES

The eyes we see in the mirror are only the visible parts of the eye, or eyeball. The **eyeball** is a sphere, slightly smaller than a ping pong ball. It is filled with a jelly-like liquid and surrounded by a protective layer called the **cornea**. The cornea covers the colorful part of the eye, known as the iris. It is not easy to see the cornea because it is thin and transparent. You look at the world through the cornea as if you were looking through a clear glass window.

Look into a mirror. Can you see the black spot in the middle of your eye? The black spot is actually a hole that allows light rays to enter into your eye and is surrounded by the iris. This hole is called the **pupil**. The iris is designed to change the size of the pupil depending on how much light there is.



“Do you see the white area of your eye?”



In bright light, the iris relaxes, allowing the pupil to become smaller so that less light can enter. In darker conditions, the iris contracts, allowing the pupil to enlarge in order to receive as much light as possible. Think about how, when you enter a dark room after playing in bright sunlight, it takes you a few seconds before you can recognize the shape of objects. Your eyes are adjusting to the dark by changing the size and shape of your pupils.

Do you see the white area of your eye? This is called the **sclera**. The sclera covers most of the eyeball. It is made of tough matter to protect the eyeball.

Look at the diagram above. Can you spot the retina? The **retina** is a very thin layer of special nerve cells at the back of the eye that collects information about the light that enters the eye. It then passes these messages along to a nerve called the **optic nerve** that carries them to the brain. It is only then that the brain can decode and process this

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<https://youtu.be/syaQgmx5i0>

Watch this exciting and funny animated YouTube movie to explore how human eyes work.

“Mr. Brain: I can't do it without you! You are my window to the world”



“Mr. Eye: I need you too! I am useless without you.”



information so that you can see the image of the object you are looking at. This whole process happens very quickly- in a fraction of a fraction of a second. It's almost instantaneous!

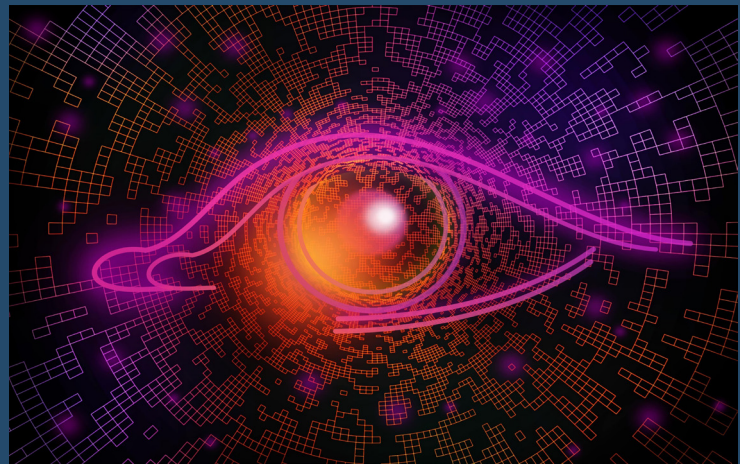
The eye is very fragile, so it has to be protected in several ways. Firstly, the eyeball is located in the eye socket within the skull. Secondly, the visible part of the eye is protected through eyelids. Your eyelids are designed to keep dust and dirt out of your eyes. They can close very quickly when something is trying to get into your eye. They are also designed to close when you need to sleep.

Do you know that tear glands produce three different kinds of tears? Some tears are produced to keep our eyes moist; others are produced in response to an irritating substance (like a speck of dirt or dust for instance), and some are



produced in response to strong emotions such as intense happiness or sadness. Ever notice how you sometimes feel better after crying? That is because your tears contain special materials that create a joyful effect in your body.

Think for a moment. How did we get functioning eyes? Can they be the products of cells or molecules? Can they be the work of natural causes or come into existence by chance? Before exploring the answer to these questions, let us first reflect on a man-made invention that attempts to mimic the behavior of our miraculous eyes.



-AMAZING SCIENTIFIC FACTS- -HUMAN EYES-

1

The human eye can differentiate between approximately 10 million different colors.

2

“In the blink of an eye” is an expression derived from the fact that the human eye is the fastest muscle in the body.

3

Our eyes remain the same size throughout life, whereas our nose and ears never stop growing.

4

Each individual eye contains 107 million light sensitive cells.

5

Though smaller than a ping-pong ball, the eye allows us to see, while cleaning, moisturizing and disinfecting itself at the same time.

6

The human eye blinks an average of 4,200,000 times a year.

7

Eyes are made up of over 2 million working parts.



Second Dimension : Analogical Thinking

HUMAN EYES VS. DIGITAL CAMERAS

You have now learned that your eyes take pictures of the world around you and send those pictures to your brain. The light rays from any object you are looking at pass through the pupil and get 'recorded' at the back of the eye, or the retina.

In a similar way, digital cameras capture images by allowing light rays from an object pass through a lens and record an image on a computer chip. Indeed, generally speaking, a camera and a human eye are very similar in the way they operate. If we break down the components of camera and the human eye and describe their functions, we will see major similarities. They are both devices capturing an image based on three principles.

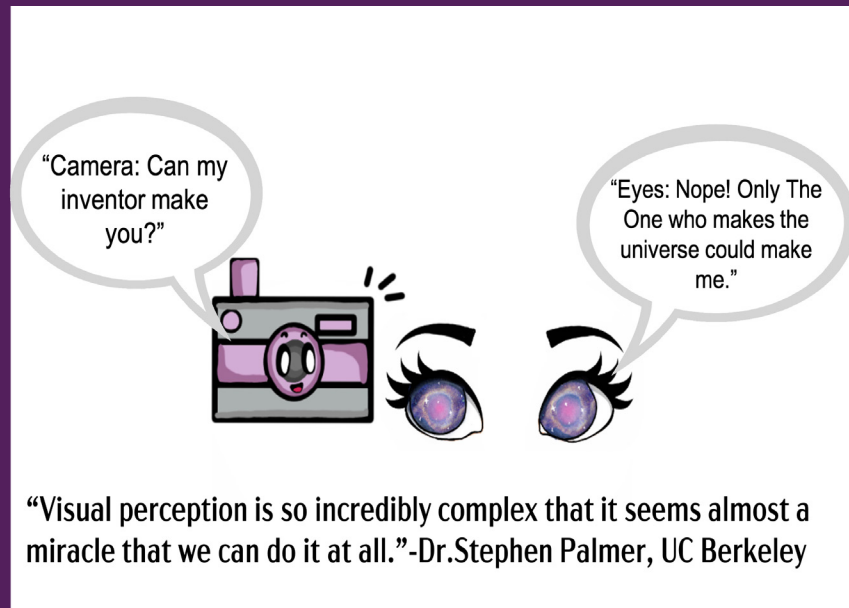
A camera's main parts include the shutter, aperture, lens, and a light-sensitive sensor such

as a film or a digital CCD. They are designed to control the amount of light, to focus, and capture the image. Similarly, the iris and pupil work like the shutter and aperture of the camera- controlling the amount of light entering the eyes. The eye's lens and cornea work like the camera's lenses to refract and focus light onto the retina- that acts like a light-sensitive medium. The retina is arguably the most important part for capturing an image. This is because the retina, which includes a system of rods and cones to convert the image to electrical impulses, sends the information along the optic nerve to the brain. In the camera, the CCD single sensors perform a similar task. The CCD sensors absorb light, then produce the electrical signals to make a digital image. The sensors have regions called pixels that work like the rods and cone cells to record a tiny part of a whole image.

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Watch this TED-Ed talk on YouTube to explore similarities and differences between human eye and camera.

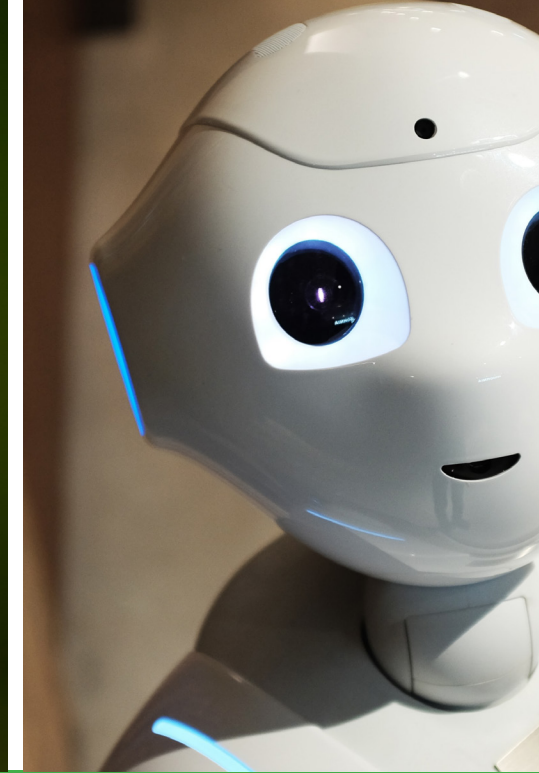


Relect on the differences between the images produced by our eyes and the images produced by man-made cameras. Remember that although modern cameras produce high definition (good quality) images, they are incomparable to the images produced by our eyes.

First of all, when producers of a high-end digital camera boast about it having 24 megapixels, this is nothing compared to the human eye that has up to 576 megapixels. Secondly, if you compare how your brain processes the signals it receives from your eyes versus the images stored by a camera's computer chip, you would see that the eye is outstandingly superior. Remember- your eyes have a remarkable ability to transmit a constant video feed to your brain to provide you with live broadcasting of the world.

The human eye and camera are also different

in terms of their chemical makeup. The former is made up of millions of living cells, while the latter is made of plastic, glass and metals. One is a static structure while the other is dynamic and constantly renewed. Assembling constantly changing fragments of pictures into a unified whole while filtering out unnecessary information in a blink of an eye is a truly miraculous feat. Indeed, Stephen Palmer, director of the Visual Perception Laboratory at the University of California, Berkeley, who spent years studying human vision and even published a book titled *Vision Science*, confessed that scientists are still ignorant when it comes to understanding how the vision system actually works: "To be brutally honest, scientists do not yet have even the remotest idea of how visual experience arises from physical events in the brain." He also says that "Visual perception is so incredibly complex that it seems almost a miracle that we can do it at all.



Third Dimension : Critical Thinking

EXPLORING THE MAKER OF HUMAN EYE

Think about man-made cameras. What does it take to make them? Do you believe that the wind can produce such devices through the random blowing of sands for thousands of years? Do you believe that animals can make them? Do you believe that a person with a very low IQ could make them? Why not? It is clear that this is because these complicated devices could only be assembled by someone who has great knowledge and ability.

Now think about the trillions of images simultaneously produced by the billions of human eyes around the world. Think about the amazing mechanisms used by our miraculous body systems that allow us to see objects around us whenever we open our eyes.

Do you think it is possible for nature with no mind to create the eye out of thin air? Is it possible that the eye emerged by accident through the random coming together of atoms and molecules? It is not even possible for cameras or even prescription glasses to emerge in those ways.

Have you heard of the bionic eye? Let us now reflect on its invention. Its inventor won the highest US award for technology achievement. He managed to design the bionic eye after studying medicine, biomedical engineering and ophthalmology for many years. Remember that this invention, however, would not have been possible were it not for the collective efforts of thousands of people around the globe.

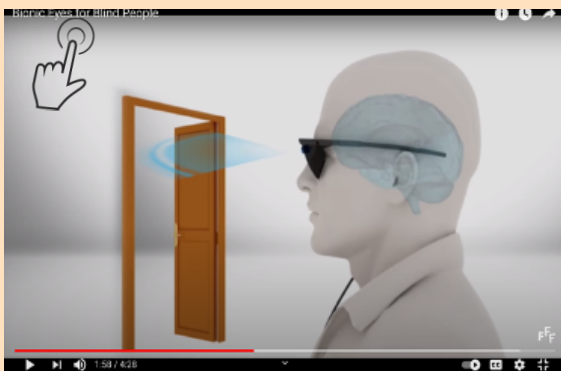


"Let us now imagine someone who examines a bionic eye."

Let us now imagine someone who examines a bionic eye. The more this person knows about technology, the more she will realize that the inventor of this bionic eye is truly a genius with much knowledge of the various sciences needed in designing and making it. Now compare the bionic eye to the actual human eye, which is a much more marvelous invention coupled with art, beauty and wisdom.

If the bionic eye needs so much intelligence, knowledge, and skill, what about a living human eye? How much more knowledge, wisdom and power is needed to make a human eye work and see? Unlike the artificial bionic eye, the human eye is made of different parts working together in harmony to form a unique and miraculous system. It is connected to the brain, the blood vessels, and even to sunlight. Is it possible to deny that this beautiful miracle of sight has a maker? Surely, if an artificial eye requires so much knowledge, skills and work, the more marvelous human eye requires a maker, too. But who is this maker?

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<https://youtu.be/b4X7-6bWxzg>

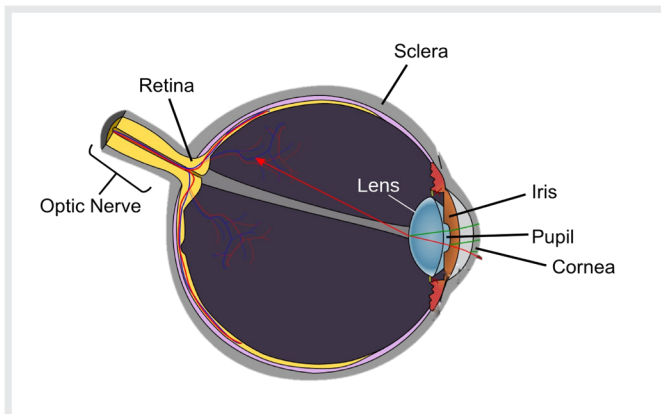
Watch this YouTube video to learn about scientific efforts to come up with bionic eyes for blind people.

“If the bionic eye needs so much intelligence, knowledge, and skill, what about a living human eye?”

Fourth Dimension : Meditative Thinking

REFLECTING ON THE ATTRIBUTES OF THE MAKER

If neither nature nor chance can be the cause of our ability to see, then how did it happen? What is the Hidden Hand behind the well-connected and organized activities in our body?



Let us take another look at the structure of the eye. Can you see how each part works in harmony with all the others so that we can see? Even the entrance of light into the eye is regulated by the means of the iris to accommodate our needs. It is as though each part takes its position knowingly for the purpose of

producing sight. Is it possible that the eye knows its connection to the brain and even to sunlight? Does the eye have the power and the wisdom to control them and use them? The eye has neither power, knowledge nor wisdom.

Look at the parts that you see in the diagram on the left: they are all made of non-living, blind matter. They have no sight, no power, no knowledge and no life. Yet each is located in exactly the right place and amount that is needed for the eye to work and see. How can blind and lifeless things come together to form an eye that sees?

Can the eye see if it is not attached to a living body? It is fascinating that the eye only functions within the human body. Outside the body, the eye would only be a piece of flesh. It would be a lump of lifeless, blind matter.

What does this mean?



The Universe and the Eyes

Whoever made the Sun must be the One who made the eyes to see using the sunlight. Indeed, one might argue that the eyes are connected to the entire universe because the Sun is a star connected to other stars in the galactic order of the universe.

This means that for the eye to see, it has to be part of a living person. It has to be connected to the brain of that person through the optic nerve. Yes, the eye only works within the head, and the head is a part of a living, breathing human being.

What do we need in order for us to stay alive and see? We need air, water, food, sunlight and gravity, among others. Actually, we need the whole world in order for our eyes to see.

Indeed, the visual system is a perfectly coordinated system of nerves, blood vessels, eye and brain structures. It works in miraculous harmony to perform the function of sight that is currently allowing you to see and read the words on this page. This visual system does not work in isolation. It cannot function without a living human being and the whole world. It is connected to the sun and the sunlight.

Indeed, without light, the eyes have no value.

This means that there is a connection between light and the eye. This also means there is a relationship between the source of light -the Sun- and the eye. Thus, whoever made the Sun must be the One who made the eyes see using the sunlight. Indeed, one might argue that sight is connected to the entire universe because the Sun is a star having a place in the galactic order of the universe.

Can we still say that the eye sees?

Is it the brain that sees then? Just like the eye, the brain is also made of blind matter. Therefore, it cannot possibly see. Indeed, the eye is just a tool like a pair of glasses through which we are granted vision. The eyes and the brain do not see. They are just tools that we use to have vision. Just as we receive the light in our homes through a process involving wires light switches and bulbs, we see through a process that involves our

eyes, nerves, and brain. In the same way that the light in our house comes directly from a power plant, our sight comes directly from the creative activity of the Hidden Power.

The connections of the eyes to the head brain, to life, sunlight, the world and the universe are like signs indicating that they are the result of creative activity. This is the creative activity of whoever makes us see through our eyes. This Giver of sight can only be The One who makes and sustains the eye together with the body. He can only be The One who sustains the body together with the whole world, that includes both the sun and sunlight. He must be the Giver of life. He has control and power over all things. He knows everything. He alone can create with wisdom. He alone can grant us sight. In short, the eyes can only be the work of The One who has the knowledge, wisdom, power and will to create perfection in every living thing.

Now that you learned how the eye must have a Maker, what can you say about His attributes? What can you say about Him by looking at the way the eye functions? And the way it is interconnected with so many other things

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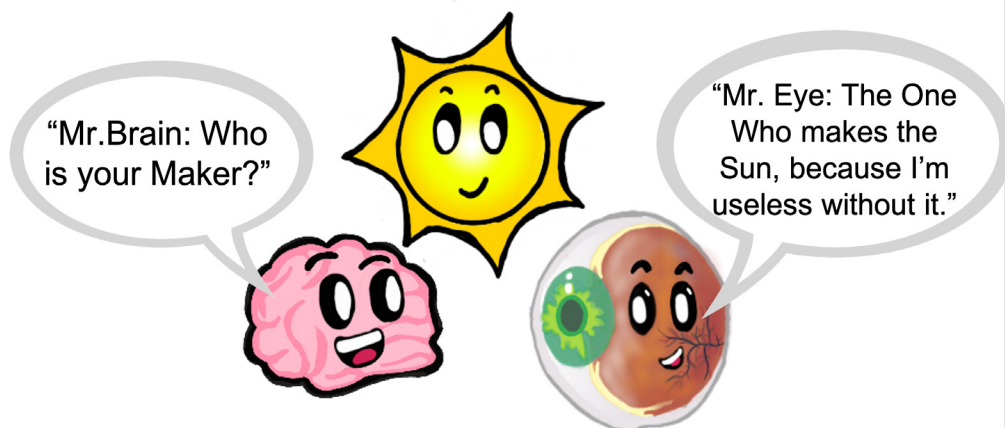
https://youtu.be/eDIma_Ai1Rc

Watch this animated movie to learn more about the miraculous inner works of human eye

within the living body and outside such as sunlight and the sun?

Clearly, the Maker of our eyes is the Maker of our whole body. He is also the Maker of the sun and the sunlight. He also is the Maker

It is clear now that the Maker of our eyes must have the wisdom, ability and power to create them. It is far beyond our knowledge and power to create and control our own eyes. We open and close our eyelids, but that is not a total control of the eye. We do



THE PROTECTOR

ALL-SEEING

ALL-WISE

ALL
KNOWING

MOST
MERCIFUL

THE
PRESERVER

THE
GUARDIAN

ALL
POWERFUL

MOST-KIND



“The Maker of the eyes must have infinite knowledge and power to create them.”

We do not control the power of seeing or losing our eyesight. Indeed, the Maker of the eyes must have infinite knowledge and power to create them. That is because of the fact that our eyes are connected to the entire universe. The Maker must see what we see. Indeed, the One who bestows the eyes, both sees the eyes and sees what the eyes see. He must know our needs for sight. He must be very kind and generous in giving us such a precious gift at no charge. Indeed, since no power can be above the Infinite Power,

He could not be forced to make the eyes. Thus, He creates eyes for living beings purely out of His mercy, just as He creates all the things we need for life. He must be very wise because He uses an extremely elegant system to allow us to see.

In short, our eyes speak about their Maker as being All-Seeing, All-Knowing, All-Powerful, All-Wise, Most-Merciful and Most-Kind. As we study the eyes, we should learn more about their Maker.

Fifth Dimension : Moral Thinking

RESPONDING WITH BETTER CHARACTER

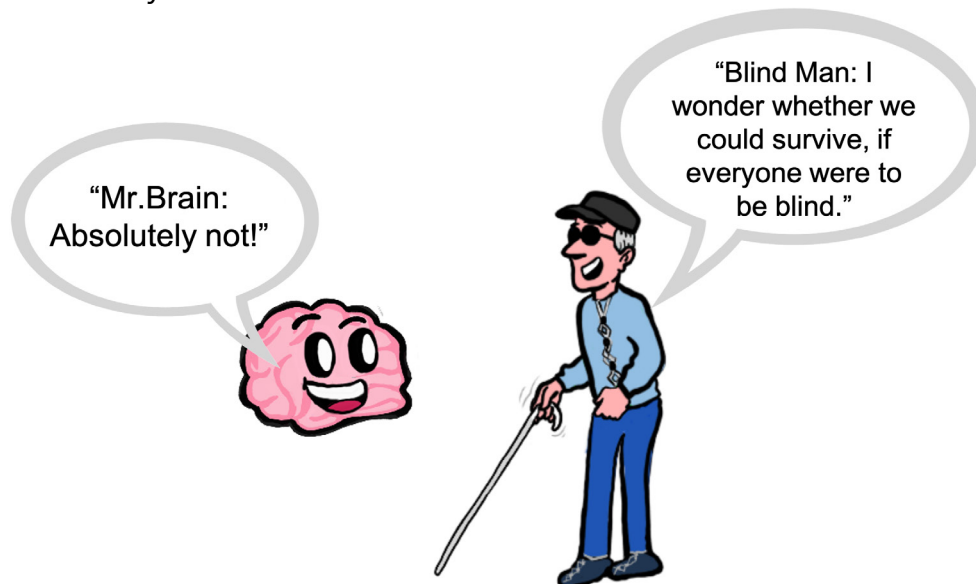
Reflect for a moment on the value of your vision. Close your eyes and try to move around for a few moments. What would life be like if you were blind for even one day? What if you were born blind but were given the opportunity to buy a pair of eyes? What price would you pay?

We rely on our sense of sight for basic survival. Indeed, the human species would be extinct if there was no sense of sight. We find food and drink with our eyes. We find our way around with our sense of sight. If we see a source of danger, we automatically search for a place of safety using our eyes.

The beauty of color can only be enjoyed with our sense of sight. Indeed, our lives are truly enriched with a pair of functional eyes. Perhaps, we need to have an annual sight appreciation day. We could ask ever-

one to use eye blindfolds on that day to appreciate the value of sight.

Where did you buy your eyes? How much did you pay for them? Of course, they are not available for sale. Even if all the scientists in the world pooled their resources and knowledge together, they would not be able to create a functional eye in its glorious perfection. If they eventually succeed in making one, it would surely cost a fortune to buy. You received your precious eyes as gifts before starting your life's journey. The One who created you gave you a pair of eyes to see the wonders of the world. Every one of us was given a unique pair of eyes. Indeed, no two eyes in the world are identical. Thus, your eyes were especially made for you. They are a truly special gift from the Most-Kind and Most-Merciful.



Would you be willing to give your eyes to someone else? How about selling them for a high price? Most of us would not accept this deal because our eyes are too precious. Shouldn't we be grateful for our eyes then? Shouldn't we thank the merciful and generous maker of the eye? Just as we usually thank someone who gives us a gift, we should offer our appreciation to the True Bestower of Bounties for this valuable pair of eyes through remembrance, reflection, and gratitude.

1

Remembrance is realizing that there is a Creator of the eye.

2

Reflection is thinking of our priceless, miraculous eyes as gifts of our Creator's mercy.

3

Gratitude is being thankful to the Creator for bestowing us with the incredible blessing of sight.

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Two Blind Sisters See for the First Time | Short Film Showcase

Up next

<https://youtu.be/EltIpB4EtYU?t=5>

Watch the story of two sisters who were blind since their birth and began seeing for the first time once they had an eye surgery.

Can you control your eyes and make them see?

You can only close your eyelids or keep them open to some extent. The Maker of the eyes is making you see right now. He gives us life at this very moment. We are his guests. He takes care of our needs. The more we reflect, the more we understand how generous and compassionate our host is. And the more we enjoy his gifts, the more we feel grateful to him and praise him. The more we realize His compassion, knowledge, and power, the more we can overcome our fear of other things. This knowing makes us even more grateful to our Maker.

After remembrance and reflection, how can we express our gratitude for and appreciation of our eyesight?

Just as we pay the price to purchase cameras and eyeglasses, we should pay our dues to the One who created the sun, the light, the air, the eyes, the brain, in addition to many other factors so that we may see. We should pay our dues to the One who does not ask for money.

God, our Maker, does not need money. Everything belongs to Him. We should offer our appreciation through good words and actions. We should remember that not only do we become beautiful when given a pair of eyes, but we are created to witness the beauty around us with our vision. We should be aware that the One who grants us our eyes sees everything. We should be mindful of Him when using our eyes by choosing what we see. We should know that He sees everything we see. He observes everything we do. He records every movement of our eyes. Thus, we should use our eyes to become better people. We should look around with curious eyes and wonder about the Maker of the universe. We should read meaningful messages in the book of the universe. We should feel a great sense of appreciation every day when we wake up for being blessed with a pair of eyes to enjoy a beautiful life.

TEST YOUR KNOWLEDGE

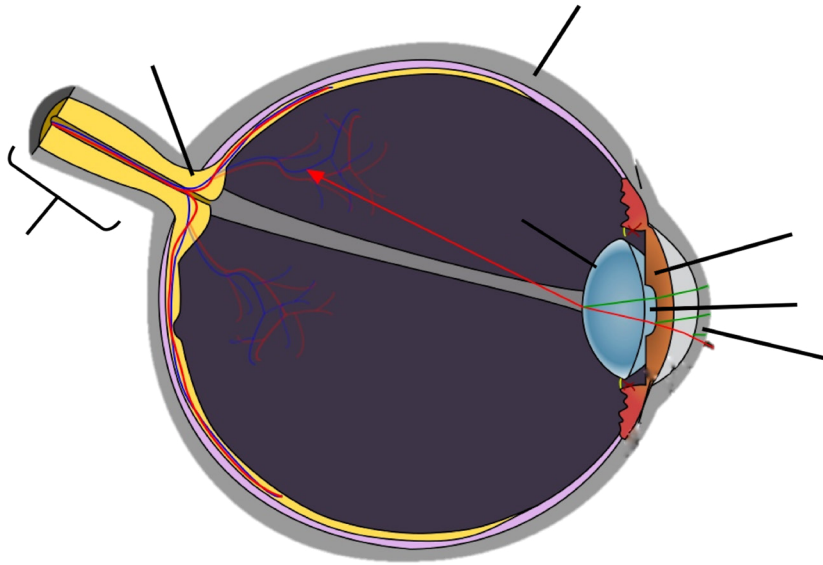
I. UNDERSTANDING SCIENCE TERMS

Complete the following sentences with a word or words from the Science Terms that will make the sentence correct..

retina *iris* *pupil* *cornea* *optic nerve*

1. The black spot that allows light rays to enter your eye is called the _____.
2. The thin, transparent, protective layer that surrounds the eye is called the _____.
3. The _____ is designed to change the size of the pupil depending on how much light there is.
4. The _____ is a thin layer of special nerve cells at the back of the eye that collects information about the light that enters the eye.
5. Information about the light that enters the eye is passed along the _____ _____ to the brain.

Label the following diagram:



II. CHECKING FACTS

Determine whether each of the following is true or false.

1. The eye emerged by accident through the random coming together of atoms and molecules.
2. All human eyes are identical.
3. The One who bestows the eyes, both sees the eyes and sees what the eyes see.
4. Sight is necessary for us to survive.
5. Sight comes with the eye, not from the eye.
6. The eye is connected to the entire universe.
7. Cells in the eye make us see.

III. UNDERSTANDING CONCEPTS

Write a short answer for each question or statement.

1. What is the intended function of our eyelids?

2. What is the intended function of our tears?

3. List the following parts of the eye in the order that light reaches them: pupil, cornea, retina, lens, jelly-like material



4. List two things which make the eye better than any man-made camera.

5. List two things we learned about the Maker of our eyes. .

6. Why is it an offense to deny the Maker of the eyes?

IV.APPLYING CONCEPTS

Write a paragraph to answer each question.

1. How are the images produced by our eyes different than those produced by a digital camera?

2. Why do you think nature or material causes such as molecules and cells could not create the eye?

3. Why do you think the eye is extremely valuable gift? Describe two things which make you appreciate the value of this gift



4. The One who creates the eyes has to be the Creator of the universe. Why?

5. How can you show your gratitude to the One who granted you the gift of sight?

6. How should we use our eyes? Why?

V. THINK-THANK GAME

In this “think-thank” game, we want you to think about your learning brain and give thanks to its Maker. We also call it the “play to praise” game. The goal of this game is to think of at least five things about your learning brain that you are thankful for.

Number of players: At least two.

Directions:

Player 1 repeats an appreciation phrase loudly and quickly. Player 2 responds, without pausing, with something to be thankful for. This is repeated five times.

To win:

Player 2 needs to respond five times (without pausing) with different things about your memory to be thankful for in order to win the game.

Here is an example of two rounds of this game:

Here is an example of two rounds of this game:

1. Player 1 repeats the appreciation phrase loudly and quickly. For example: “Thanks to the Maker of the eyes.”
2. Player 2 responds, without pausing, with something about the eyes to be thankful for. For example: “For making the iris change the shape of the pupil.”
3. Player 1 repeats the appreciation phrase again loudly and quickly. For example: “Thanks to the Maker of the eyes!”
4. Player 2 responds, without pausing, with another thing about the eyes to be thankful for. For example: “For making our eyelids protect our eyes!”

This should be continued for another three rounds until Player 2 wins or loses.