

HEALTH AND THE HUMAN MIND

Grades 7-8

STUDENT JOURNAL

This journal belongs to:





INSTRUCTIONS

This student journal accompanies *The Good and the Beautiful Health and the Human Mind* science unit. It contains all the worksheets and journal pages that are needed to complete the unit. Each student will need his or her own copy of the science journal.

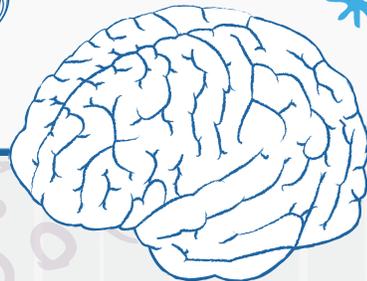
The *Health and the Human Mind* lesson extensions are also found here. These extensions are optional for older students (grades 7–8) to complete on their own. Each extension is accompanied by lined paper so the student can keep his or her work in one place.

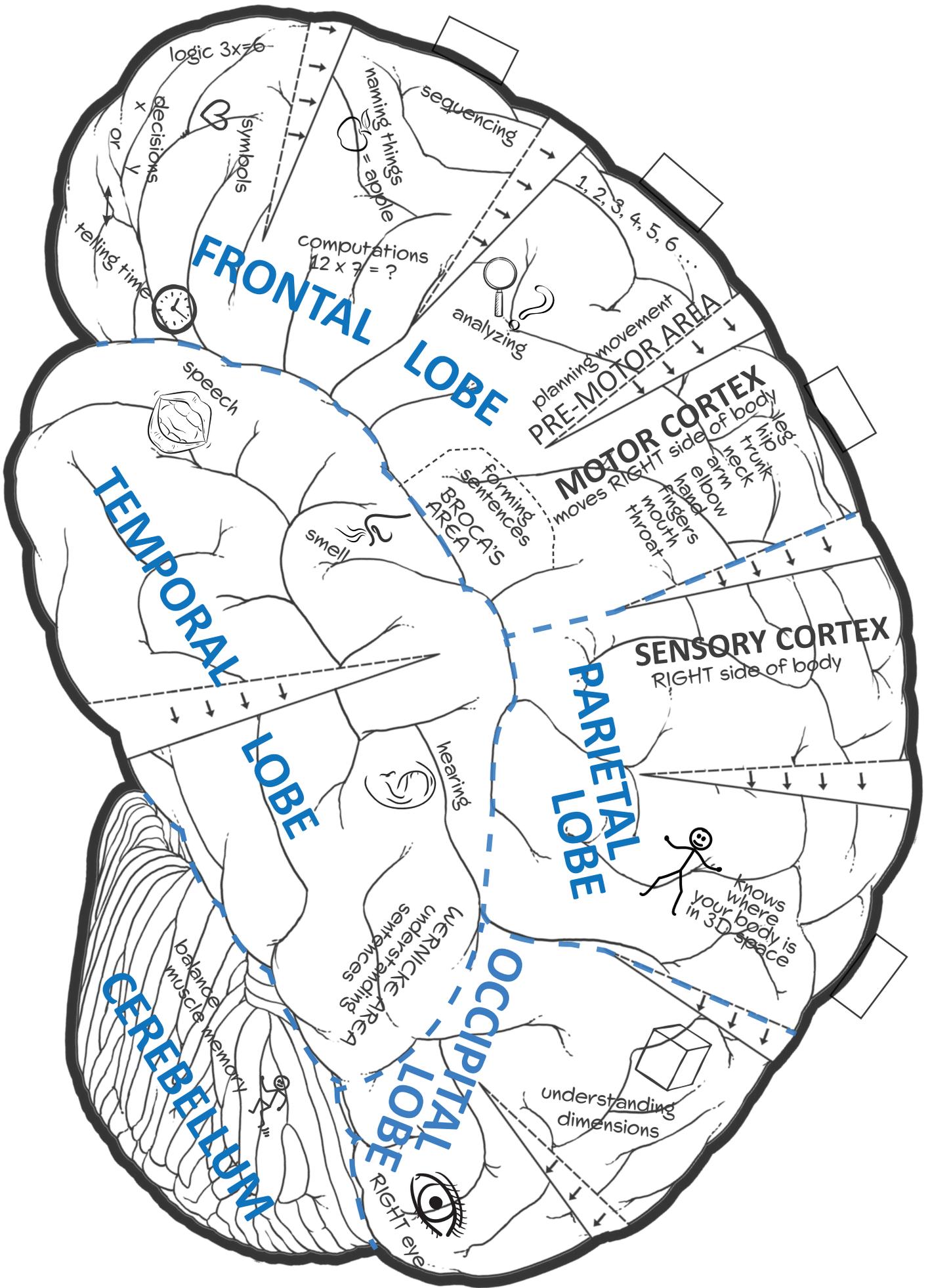
Have each student take his or her time to create high-quality work as the activities and worksheets are completed. Students may enjoy looking back on their past discoveries when they've finished.

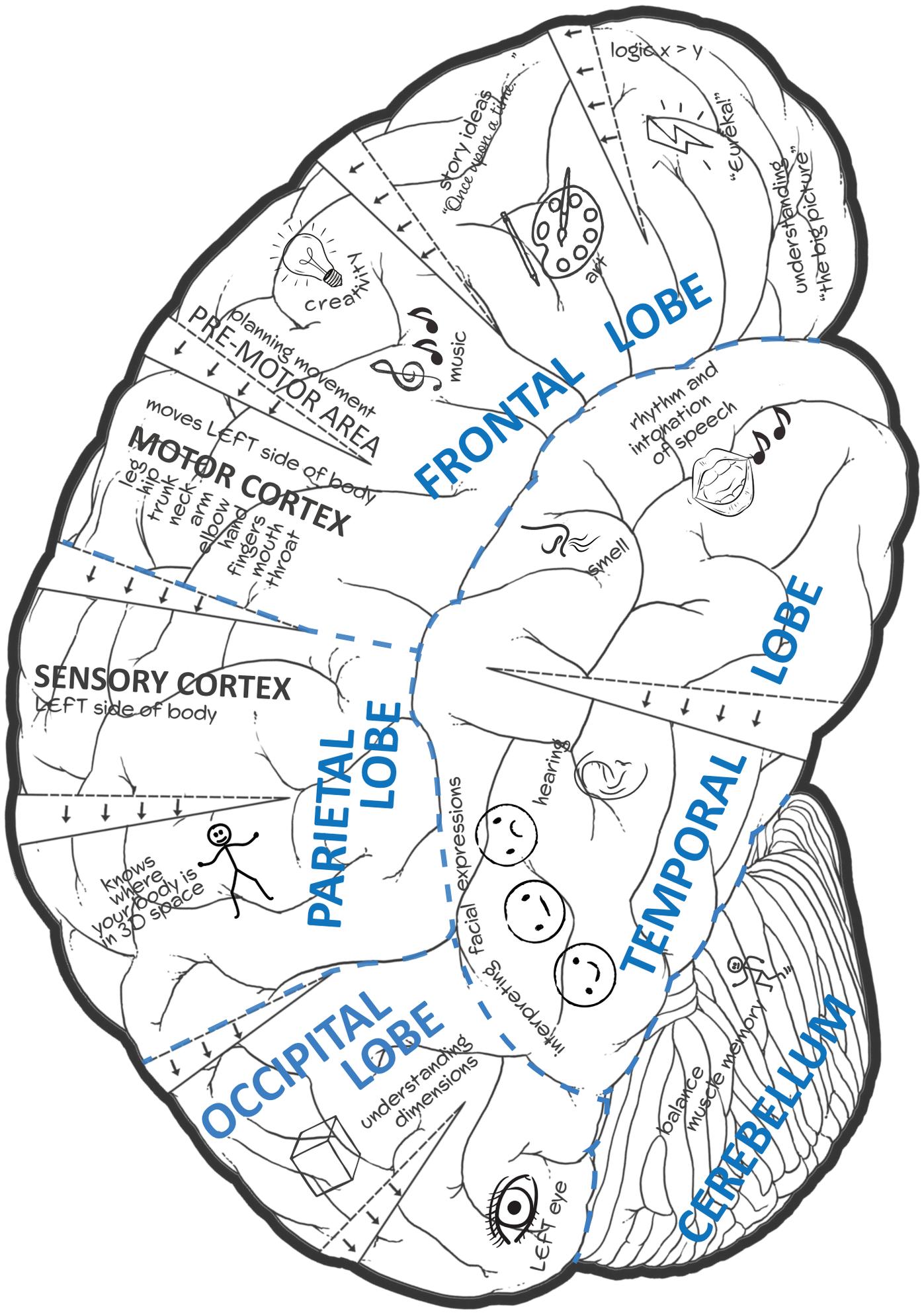


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EXTENSION

Instructions:

1. Read the information below.
2. Think about a favorite sport or physical activity you like to do. What are some ways you can protect yourself from a concussion while doing that activity? List two or three.

Brain Injuries

A teenage girl was swimming backstroke in a pool. She got off course and ran into a sharp corner of the pool, hitting her head hard. She was diagnosed with a concussion and experienced symptoms for several months afterward.

What Is a Concussion?

A concussion is a type of traumatic brain injury (TBI). It occurs when force is translated to the brain, causing the neurons to function abnormally. Concussions are generally caused by a direct bump, hit, or jolt to the head, either with or without the loss of consciousness. Traumatic brain injuries are most often a result of a fall, a physical hit, a vehicle accident, or a sports-related injury. The symptoms of a concussion are usually temporary and can include headaches, memory loss, dizziness, confusion, sleepiness, and nausea. While there is no specific cure for a concussion, a medical professional may prescribe rest, activity restriction, and possibly medication.



With over 3 million cases per year just in the United States alone, concussions are the most common type of traumatic brain injury. However, there are several other types of brain injuries that can lead to severe complications or even death. Read the information to the right to learn more.

Types of Traumatic Brain Injuries

CEREBRAL EDEMA: Fluid pools around the brain, which increases the pressure inside the skull, reducing blood flow and starving the cells of glucose and oxygen. While swelling is the body's natural response to an injury, cerebral swelling can cut off the blood supply to the brain, which results in a lack of oxygen. Without adequate oxygen, brain cells can be damaged or die off, causing irreversible damage or even fatalities.

DIFFUSE AXONAL INJURY: This injury is caused by a strong shaking or rotation of the head by outside forces, such as a vehicle accident. As the brain moves back and forth inside the skull, it repeatedly collides with the inside of the skull. As a result, the brain can become bruised, nerve fibers can tear, and bleeding can occur. If a person survives a diffuse axonal injury, he or she will likely need various therapies, such as speech, physical, and occupational, although some long-term issues may remain. It is estimated that around 90% of diffuse axonal injury survivors remain unconscious. Those that do regain consciousness often remain severely impaired in many cognitive, behavioral, and physical ways.

INTRACRANIAL HEMATOMA: An intracranial hematoma, a bruise that causes blood to collect and pool, is most commonly caused by a blood vessel that bursts within the brain from some sort of trauma, such as a vehicle accident or fall. Symptoms may develop immediately following the injury, or it may take several weeks for them to appear. An intracranial hematoma can potentially be life-threatening and usually requires immediate treatment, such as surgery, to remove the blood that has pooled inside the skull.

Facts

- In 2018 approximately 15% of all US high school students sustained one or more concussions as a result of sports and recreation.
- Statistics show that males are much more likely to suffer from a TBI than females.
- 50,000 adults and children die in the United States each year due to brain injuries.
- More than 5 million people in the US live with a disability related to a TBI.

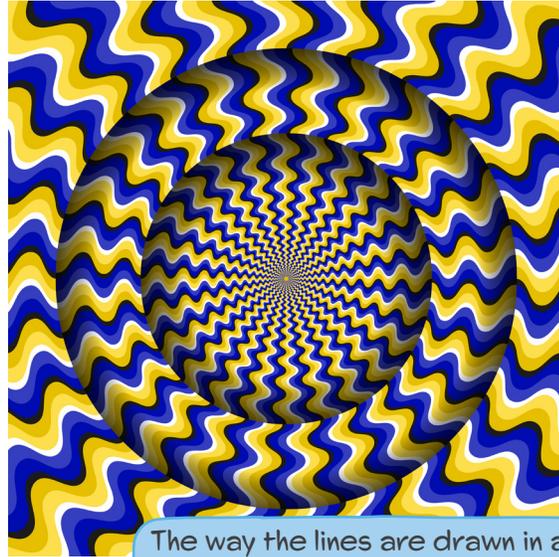
OPTICAL ILLUSIONS

3 Stare at the center of the circle and watch as the circles move!

Circle the direction you see the center circle going.



Circle the direction you see the middle circle going.



The way the lines are drawn in alternating patterns and divided into circles tricks our brains into thinking that the image is in motion.

4 Look at the cube and answer the questions below.

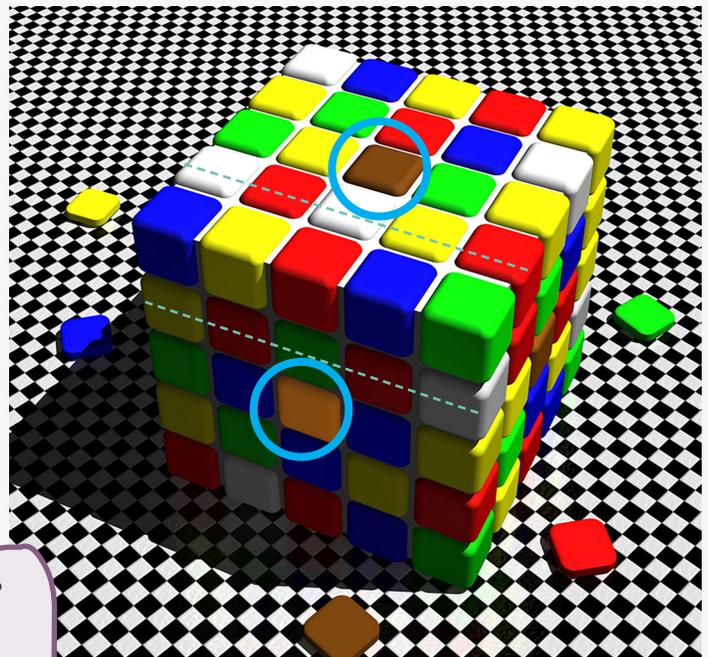
○ Are the two circled squares the same color?

YES NO

○ Use two fingers to cover the section inside the dashed lines. Then stare at the two colors.

○ Are they the same color now?

YES NO



The reason this illusion works is because our eyes take information from what is surrounding the object we are looking at.

Instructions:

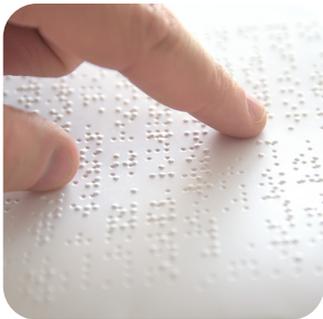
1. Read the information below.
2. Use the Braille alphabet to write, just like the dots below, a short message to a parent or friend. Show that person the key pictured in this extension so he or she can read your message!

EXTENSION

Adapting to Blindness

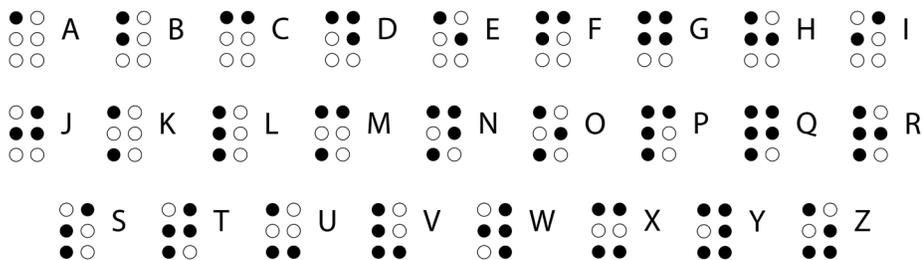
Imagine waking every morning, opening your eyes, and still seeing the darkness of sleep. Instead of seeing morning light filtering through the window, you can only feel its warmth on your skin. This is the world of someone with total blindness. Roughly 15–20% of people with eye disorders live in a completely dark world. Far more experience low vision that can be aided by glasses, contacts, or surgery. Total blindness cannot be aided by these tools, but there are many other tools and resources that make it possible for those without sight to succeed in the world around them.

Braille Alphabet: One helpful tool that benefits people with low vision is the Braille alphabet, which was invented by Louis Braille in 1824. A system of raised dots that are read with the fingers rather than the eyes, Braille is a specialized code that can be used in multiple languages. Six raised dots in two parallel columns with three dots in each



column comprise Braille cells. With these six dots, sixty-four different combinations are possible, representing letters of the alphabet, numbers, complete words, and even punctuation.

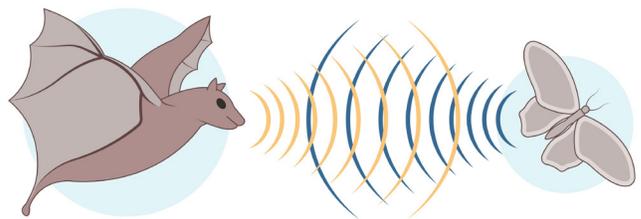
In addition to reading, Braille also enables those who are blind to write. When writing, a person uses a slate that contains evenly spaced depressions for the dots. The writer uses a stylus to push dots into the paper. Braille can also be produced on an electronic machine called a Braille writer.



Less than 1% of the world’s literature is published in Braille, but modern technology has enabled blind people to take any book, have someone scan the pages into a computer, use software to translate the document into Braille, and print it with a special Braille printer.

Heightened Senses: A visually impaired person relies on other senses to navigate the world. Have you ever noticed that many pedestrian crossings have audio cues, such as beeping or repeating the word “walk,” to help blind people cross the street? Familiar routes often have other familiar sounds. By mentally keeping track of these sound landmarks, a person can take a regular route with confidence.

Echolocation: Some blind people have even been able to learn to use their sense of hearing to echolocate. When people use echolocation, they make clicking sounds with their tongues, and, with practice, they can learn to hear that clicking sound bouncing back from the objects around them. Amazingly, the brain is able to adapt areas that normally process visual cues from the eyes and use those areas to interpret echoes from the clicking!

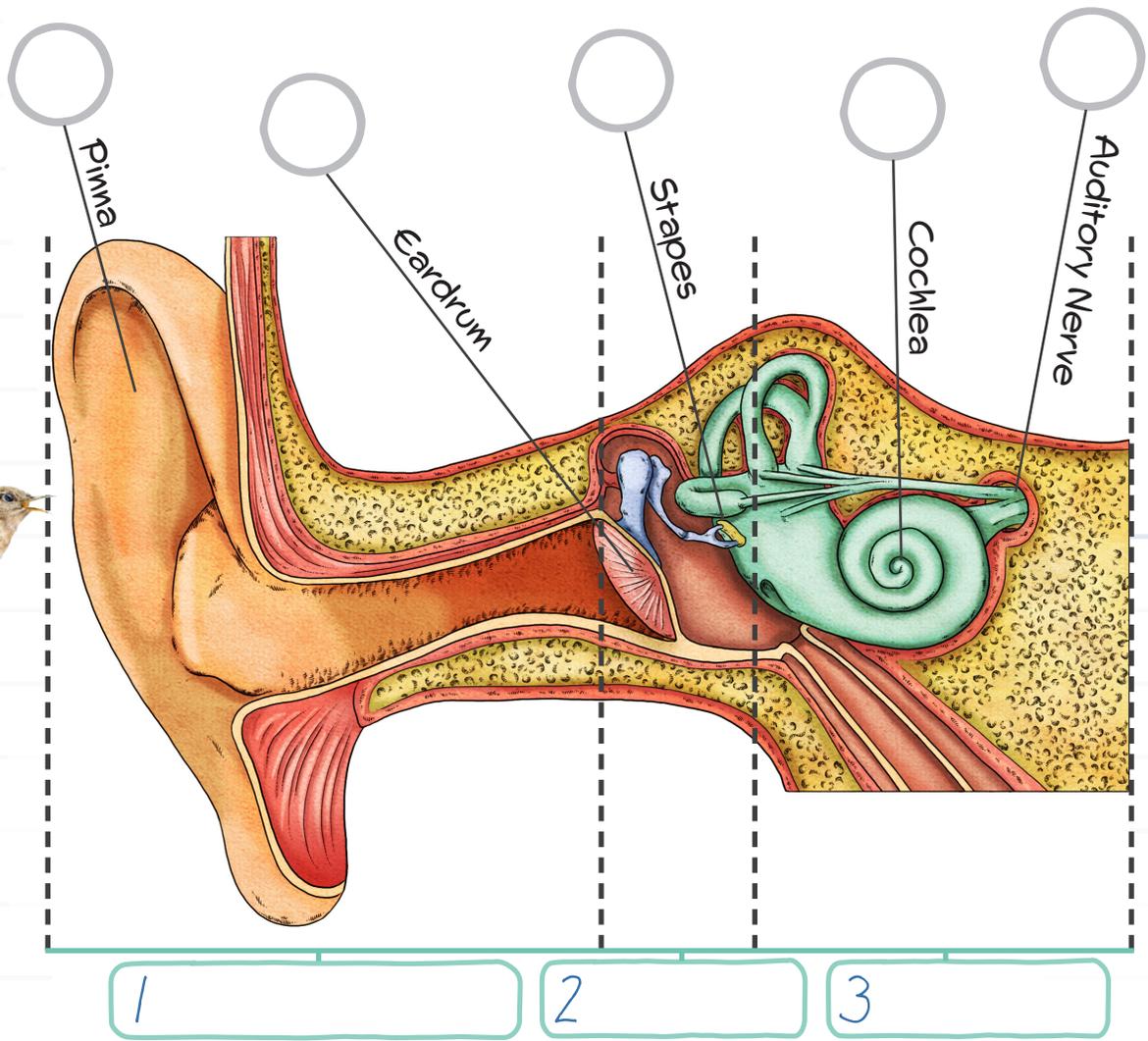


These are just a few examples of the many tools and adaptations that blind people are able to use to live a fulfilling life. Others include guide animals and voice technology. With these tools and the amazing ability of our brains to adapt, those with low vision or blindness can thrive in the world around them.

THE PROCESS OF HEARING

Using the word bank, label the sections of the ear on the diagram below as you listen to the steps in the process of hearing. Then read the functions, one at a time, on the next page; find the part of the ear that each function refers to; and color the circle next to each part the same color as the circle next to the matching function.

HUMAN EAR ANATOMY



WORD BANK

middle ear inner ear external ear

Instructions:

1. Read the information below.
2. Write a paragraph describing several smells for which you are especially grateful.

EXTENSION

Anosmia

Our sense of smell is something we often take for granted. We appreciate it when we smell fresh-baked bread or spring flowers, but we may pinch our noses closed to avoid an unpleasant smell like burnt food or sour milk. We may not always appreciate our sense of smell, but without it, the world around us and the food we eat would be very different. People who develop a condition called *anosmia* [uh-naaz-mee-uh] lose their sense of smell, sometimes permanently.

Congenital Anosmia: If the olfactory system doesn't develop correctly in the womb, a baby might be born with *congenital anosmia*. This condition is relatively rare; most people who experience a loss of smell develop it because of an illness or injury. Some people might have tumors in their noses that obstruct their sense of smell, but other conditions affect how the brain's olfactory center processes information.

Traumatic Brain Injury: A head injury can also cause a person to lose his or her ability to smell. In fact, it is estimated that up to 30% of people who suffer a traumatic brain injury may experience this. The olfactory nerves, which are located behind the eyes, can be damaged by a head injury, either by the blow itself or by internal bleeding. The more severe the brain injury, the more severe the anosmia is likely to be. Because our sense of taste is so closely linked to our sense of smell, people with this condition usually also suffer from an inability to taste. They may only be able to detect salty, bitter, sweet, sour, and umami, the tastes detected by the taste buds in the mouth and tongue, and not all the subtle differences in taste that are detected by the olfactory system.

Virus: Some viruses can cause temporary or permanent loss of smell. One example is the SARS-CoV-2 virus. A

common symptom is a loss of smell that generally persists for a few months. Other viruses, like the common cold, also disrupt our sense of smell. One reason is because of the mucus that fills the nasal cavity. Other viruses cause the olfactory nerve cells to release protective antibodies that change how these cells function. The immune response disrupts the cells' ability to transmit smell information to the brain, and the olfactory cells may take a long time to recover.

Other Sources of Anosmia: Alzheimer's disease, some types of cancer, diabetes, and Parkinson's disease are a few additional conditions that can cause temporary or permanent anosmia.

Whatever the cause, anosmia provides unique challenges for people who develop it. They may lose their appetites or add too much sugar or salt to their food in an attempt to make it taste better. They may also experience depression as they miss their lost sense. Additionally, because the sense of smell is closely related to memories, some people report having trouble recalling some smell-related memories.

As with any other lost sense, there are potential treatments, such as medicine and surgery, as well as the potential for our brain to adapt. With continual increases in technology, additional help may be available to those who face the challenge of anosmia.



BRAIN STEM CRACK-THE-CODE



Use the code to solve the questions below.

A	B	C
D	E	F
G	H	I

J	K	L
M	N	O
P	Q	R

	S	
T		U
	V	

	W	
X		Y
	Z	

1

What connects your brain to your spinal cord?

2

The brain stem is divided into how many parts?

3

The brain stem is responsible for the body's most _____ functions.

MEMORY TERMS MATCHING

Draw a line from each term to its definition.

Working Memory

These are memories that are stored for less than 30 seconds. This type of memory is stored in the temporal lobe of the brain.

Long-term Memory

The inability to remember things from one's past or to make new memories is often caused by illness or injury.

Sensory Memory

This type of memory storage holds what you need to remember or know how to do in the moment. It is useful when taking tests at school.

Amnesia

This type of memory passes from short-term memory into more permanent storage. Emotions are important for recall of these types of memories.

Short-term Memory

This type of memory comes from what the body is experiencing in the outside world. This kind of memory is not stored and may be moved into other memory storage or forgotten immediately.

Instructions:

1. Read the information below.
2. Imagine you are Ruth's daughter. Write a paragraph about your experience taking care of Ruth.

EXTENSION

Memory Loss Case Study

Ruth is a widowed grandmother in her late 70s. Her children notice she is having trouble remembering things, and more concerning, she is making mistakes in her daily life that could be dangerous, such as trying to put an electric skillet onto the stove instead of plugging it into the wall. Ruth's family talks to her about moving in with her daughter, and she agrees. Ruth is sad to lose some of her independence, but she is becoming more and more confused.



In her daughter's home, Ruth begins to experience changes in her personality. Always a loving and kind woman, she begins to be impatient, angry, and irritable. She is sometimes unkind and even uses swear words at times, something she would never have done before. Her family needs to lock the house at night so Ruth doesn't get lost. Often, she doesn't recognize familiar people, even her own daughter.

As Ruth continues to decline physically, her daughter provides her with a wheelchair, helps her to eat, and does her best to make sure her mother is comfortable in the final stages of her wonderful life. Ruth is an incredible mother, and her daughter feels grateful to have a chance to help her in return.

Alzheimer's Disease

Ruth suffers from a brain disorder called *Alzheimer's disease*. This disease is caused by an abnormal build-up of proteins in and around brain cells. These proteins disrupt

how the brain functions and interfere with neurotransmitter chemicals sending messages between brain cells. Eventually, the brain even begins to shrink.

There are many facilities dedicated to providing people with Alzheimer's disease and other memory loss a safe environment and the care they need. These facilities have extra security, like cameras and digital locks, to help keep those who live there safe. They may also have features such as curved walls, which reduce feelings of disorientation, and memory boxes outside each person's room or apartment. These boxes contain small personal items that help the residents remember which room belongs to them. Muted paint colors and soft lighting also help individuals with memory loss feel calm.

**Staying Active—Physically and Mentally—May Help**

Although there is nothing that will completely prevent Alzheimer's disease, some studies indicate that eating a diet rich in plant-based foods and maintaining a healthy weight with regular physical activity may help. Scientists also recommend keeping your mind sharp with activities like puzzles, learning a musical instrument or foreign language, trying new activities, and keeping an active social life.

Although scientists don't know why some people develop Alzheimer's disease, these are considered risk factors:

- Advanced age
- Family history of the disease
- Previous head injury
- Cardiovascular disease

NATURE HELPS OUR BODIES



EXTENSION

Instructions:

1. Read the information below.
2. Choose a flower to observe close up. Set a timer for five minutes. In your science journal, write and draw every detail you notice. You may use colored pencils or watercolors to add to your journal if desired.

Nature Journaling

“Journaling is the single most powerful tool to supercharge your observation, memory, and connection with nature. It is the critical foundational habit of being a naturalist and scientist.”

—John Muir Laws

How many times have you said to yourself, “I want to remember this moment forever?” Sometimes special moments stay with us, but other times we forget experiences that were once meaningful to us. Studies have shown that humans process only a small percentage of the things we experience through our senses, and we remember even less. However, the process of journaling is enough to imprint these important moments into your memory.

Naturalists, scientists, and writers in all areas of study use journals to keep track of what they have seen, studied, and considered throughout their work. Observing and journaling what you notice will enable you to pause and look more closely at what you’re discovering. You don’t need to be good at drawing or even at writing to keep a journal. Rough sketches and short phrases jotted down as you explore are effective enough to open up a world of possibility and discovery.

John Muir Laws is a wildlife biologist, an artist, and an explorer of the natural world around him. If you were ever to meet him while on an outdoor adventure, you would most

likely see him with a notebook in hand, drawing pictures of everything he encounters. He uses nature journaling to enhance his curiosity, creativity, and ability to observe whatever is in front of him. Laws adheres to the idea that journaling will help you

discover that there is an infinite amount of wonder and beauty in things that we tend just to walk past every day. He has said, “The journal is not about the picture. It’s about paying deeper attention.”



Spending time in the natural world is a simple way to reconnect with nature and can do wonders for our overall health and mental well-being. One of the biggest benefits of nature journaling is that it requires us to slow down. Even if it’s just for a few moments, taking the time to observe and appreciate the wondrous

world our Creator has given us is enough to help us re-center our thoughts and allow us to feel refreshed, refocused, and ready to take on the rest of the day.

Tips for Nature Journaling

- Nature journals don’t have to be fancy. You can simply staple a few pieces of printer paper together.
- Try drawing at least some of the things you see. Drawing improves your observational skills.
- If you want, you can use colored pencils or watercolors to add some color to your journal illustrations.
- Try using statements like “I notice . . .,” “I wonder . . .,” or “It reminds me of . . .”
- Your journal is a record of your learning and experiences with the natural world around you. It doesn’t have to be perfect.
- You don’t need to share your journal with anyone.
- Don’t feel as if you have to write in your nature journal every day. Just spending time in nature each day can revitalize your mind and spirit.



HEALTHY HABITS WORKSHEET

Answer the questions about healthy habits, preventative care, and enjoying some activities in moderation by filling in the blanks with the words in the word bank at the bottom of the page.

You should visit the dentist every _____ .

Electronics are best enjoyed in _____ .

A _____ is a good addition to a healthy diet.

A _____ is something a person does often and in a regular and repeated way.

Visiting a doctor or health care professional for an _____ once a year is a good preventative measure.

_____ is the ability to regulate one's emotions, thoughts, and behavior in the face of temptations and impulses.

Healthy Habits

WORD BANK

vitamin

moderation

six months

exam

habit

self-discipline

EXTRA NOTES

