Human Anatomy - The Brain
Worksheet

1. Do you remember learning how to tell time? Do you like to share your thoughts about the latest viral video? Have you ever wondered about the meaning of life? Well, each of these reactions can happen only because you are a human. Your brain shares similarities with other organisms in the animal kingdom, but differences in structures and the chemistry of your brain allow for the complex processing and interactions that define us as human. Your brain has more than 100 billion nerves that form trillions of connections for communication. Use the Camera in your Tools to explore the brain.

2. Let’s look at the brain in more detail. Your brain weighs about three pounds, but uses 20% of your body’s energy! The majority, or about 66%, of your brain is the cerebrum, which is made of two hemispheres, the left and the right. This part of your brain coordinates voluntary actions and processes the massive amount of information that is collected through your sensory organs. Write a list of specific functions that the cerebrum would control.

3. The cerebrum is divided into four lobes, and each controls different functions. The Latin word for forehead was used to name the frontal lobe. This lobe coordinates voluntary movements, parts of speech, problem solving, planning, reasoning, and emotions. This may be the location of the brain that most determines your personality. What are some characteristics that make you who you are? What are some of your likes and dislikes?

4. The temporal lobe focuses on interpreting sounds and smells. You can remember the name of this lobe by connecting *temporal* with the tempo of a song. When you hear a song, your temporal lobe, located along the sides of your head near your ears, will gather the information and interpret the tempo, maybe communicating with other parts of your nervous system to get your feet tapping to the beat. Note that when you are looking at a brain, the right and left hemispheres are always determined as if the brain were inside a body.
5. The occipital lobe, at the back of your head, processes visual or optical input. Remember that *occipital* and *optical* are words that start with the same letter. In order to make sense of visual input, the occipital lobe must reference previous experiences and memories. The occipital lobe is named for the occipital bone, a part of the skull that protects this part of the brain.

6. The parietal lobe is located behind the temporal lobe and above the occipital lobe. This area of the brain is associated with interpreting touch information and works to help you know where your body is located in space relative to other objects. This is very important as you maneuver around the classroom without bumping into desks or peers. A fun way to remember this lobe is that *parietal* may remind you of the word *parent*. Parents are superior to their children and the parietal lobe is above or superior to the temporal lobe. When we are infants, parents focus on helping us understand the physical world and how to move around.

7. Each lobe of your cerebrum performs specific functions that allow you to interpret and respond to your environment. A concussion occurs when the brain has been shaken and part of the brain hits the skull, causing damage to the tissue. A concussion can occur when you play sports, are in a car accident, or fall down. Review the information you have learned about the lobes of the brain. Then use Notes to label the four lobes and explain what you think would happen if a concussion occurred at each of the four lobes of the brain. Then take a photo.

8. Did you know that your right hemisphere controls the left side of your body and the left hemisphere controls the right side of your body? Which side of your brain controls the hand you write with?
9. As you can see, the cerebrum can be dissected into two hemispheres, the right and the left. Remember that right and left are always determined as if the brain were inside a body. A thick band of nerve tissue, the corpus callosum, connects the two hemispheres and allows for communication to occur between the two sides of the brain. What would happen if this portion of the brain were damaged?

10. Tucked underneath the occipital lobe is the cerebellum. This structure regulates and coordinates movement and balance. Remember that the cerebellum helps a ballerina learn how to leap and spin. Dissect the cerebellum. What similarities do you see between the shape and structure of the cerebrum and the cerebellum?

11. The midbrain, pons, and medulla oblongata make up the brainstem. This portion of the brain controls many of our most basic and vital functions, such as breathing and heart rate. The brainstem connects with other portions of the brain to help process sensory input and control voluntary movements. The brainstem is also the direct connection to the spinal cord. What might happen to someone if they damaged their brainstem?
12. Time to review! Use the Model Gallery located in your Backpack to add a model of the human brain. Add Notes to label as many structures and functions as you can remember. Then take a photo.

13. The brain is the most complex organ in your body and scientists are still working to understand how the brain functions. There are functions that set the human brain apart from other animal brains. We can develop metacognition, the awareness and understanding about our own thoughts and how we learn. Use your metacognition now and share some curious questions you have about your brain.