

# The Brain



# Part I: Make a Clay Model

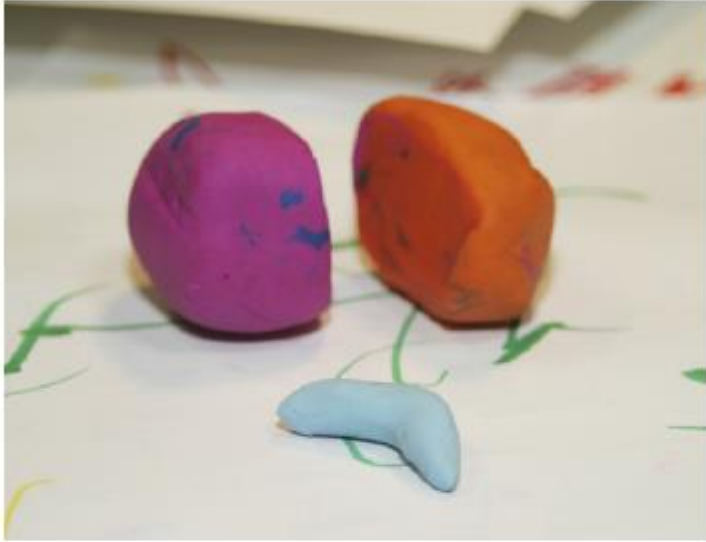
- Objective: to learn the anatomy and functions of the following parts of the brain
  - Cerebrum (left and right hemispheres)
  - Cerebellum
  - Brain stem
  - Corpus callosum
  - Gyri & sulci
- Materials:
  - Different colors of clay
  - iPad (to take a photo at the end)

# Step 1: Cerebrum



1. Use two different colors of clay. Make two identical ovals that are about the size and shape of an egg. These are the two hemispheres that make up the cerebrum.
2. Gently press each oval shape onto the desk to flatten one side. Put the halves together and shape them so that they are equal. Then separate them.

# Step 2: Corpus Callosum



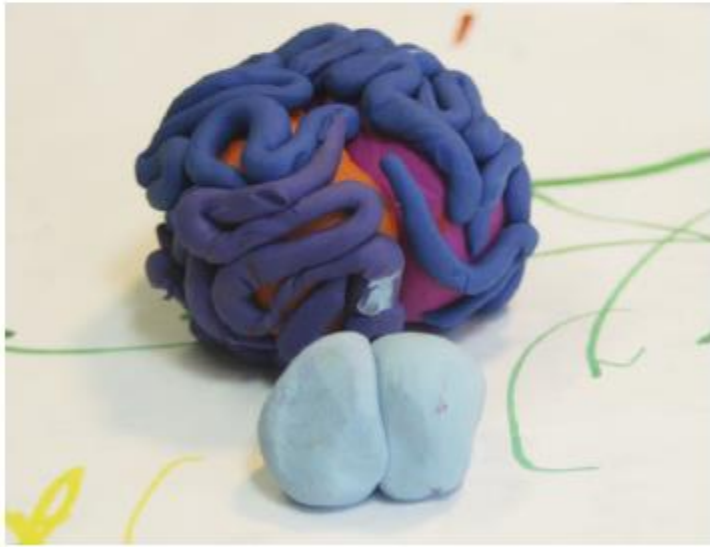
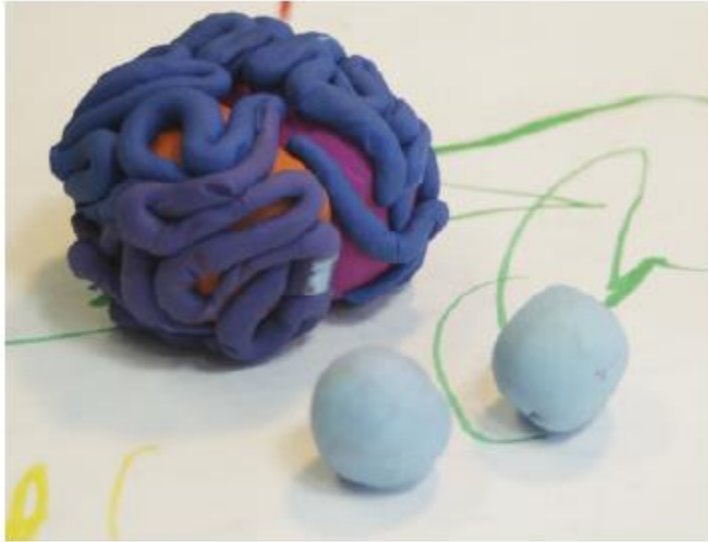
1. Use a third color of clay to make a small cylinder with pointed ends. This is the corpus callosum. It connects the two hemispheres.
2. Press the corpus callosum into the flat side of one of the hemispheres. Now, join the two hemispheres together, so that the corpus callosum is between them. Don't press too hard – you need to be able to separate the hemispheres later.

# Step 3: Gyri/Sulci



1. Use a fourth color of clay to mold long, thin, worm shapes. These are the gyri and the sulci. (The gyri is the clay; the sulci are the grooves between the gyri.)
2. Bend and loop the worm shapes as shown in the pictures. Press them gently onto the hemispheres everywhere except the bottom.

# Step 4: Cerebellum



1. Use a fifth color of clay to form two small ovals, about the size of a marble. These are the two spheres that make up the cerebellum.
2. Press the two ovals together until they join. Then, attach them to the back side of the brain, at the bottom.

# Step 5: Brainstem



1. Use one final color of clay to form a skinny shape with a pointed end, about 2-3 cm long. This is the brainstem.
2. Connect the brainstem to the brain. It goes at the back of the brain, underneath the two smaller spheres of the cerebellum.

# Photos & Keynote

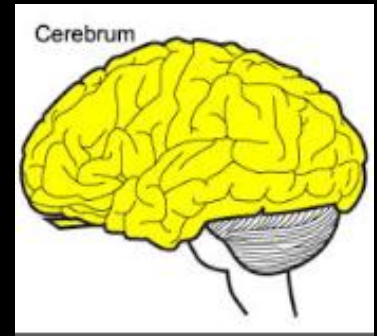
- You will take two photos of your completed brain model.
- The first picture should be of the entire brain.
- Then, gently divide the brain in half so that the corpus callosum can be seen. Take another picture showing the two halves of the brain.
- Open a Keynote presentation. You will make one slide for each part of the brain. Each slide will include a labeled picture and a written summary.
- Read the following pages of this presentation to learn more about each brain part.
- After you read, make a slide in your Keynote for each brain part. Include:
  - A picture of the brain, with the brain part labeled
  - A summary about the brain part



# Slide 1 (Title Slide): Labeled Brain

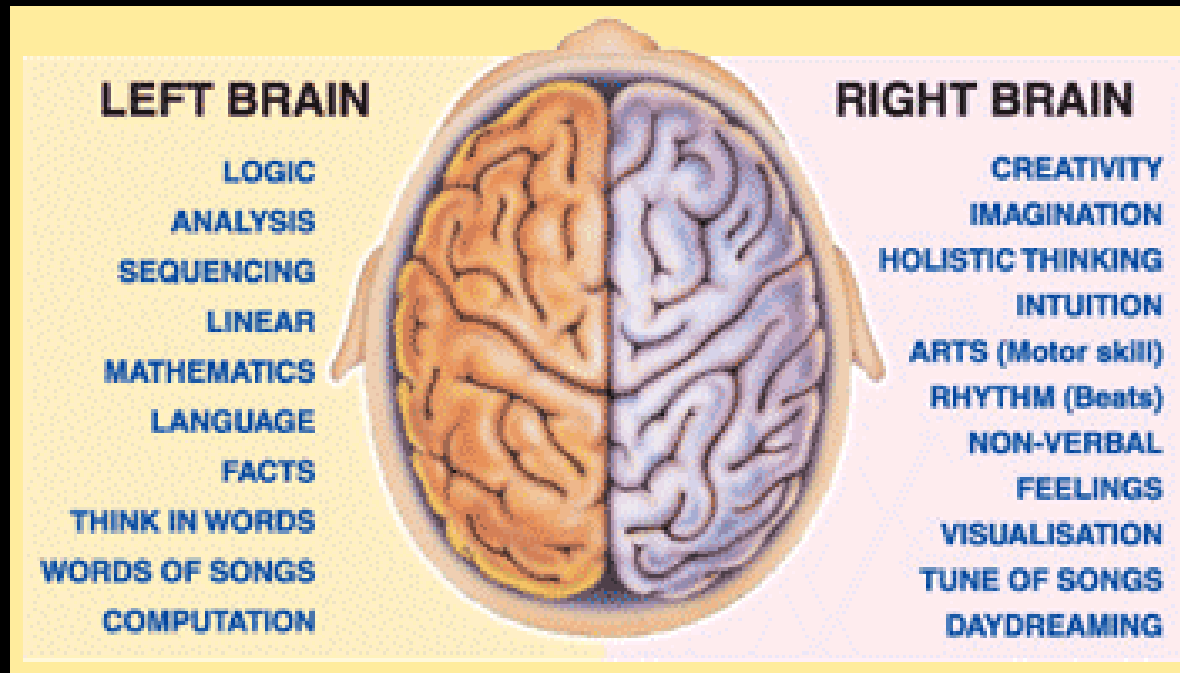
- Write your full name and block
- Using the photo of the two halves of the brain, label the following parts:
  - Cerebrum
  - Corpus callosum
  - Gyri/sulci
  - Cerebellum
  - Brain Stem

# Slide 2: Cerebrum



- The brain is made up of different structures. Like the Earth, the **cerebrum** (top/biggest part of the brain) is divided into two hemispheres - left and right. The word "hemisphere" means "half of a circle" in Latin.
- There are many interesting things to learn about the cerebral hemispheres. For example, did you know that the **left hemisphere** controls the right side of the body, and the **right hemisphere** controls the left side of the body?
- The cerebrum is extremely important because it **controls our thinking**. Humans have much bigger cerebrums compared to other animals, because of all of the advanced **thinking** that we do, and our ability to **imagine**.
- While the hemispheres look the same, they have different functions. In most people, the **left hemisphere** is dominant for (controls): language, speech, writing, math, and logical reasoning. The **right hemisphere** is dominant for (controls): music, spatial awareness, art, intuitive thought, and imagination.

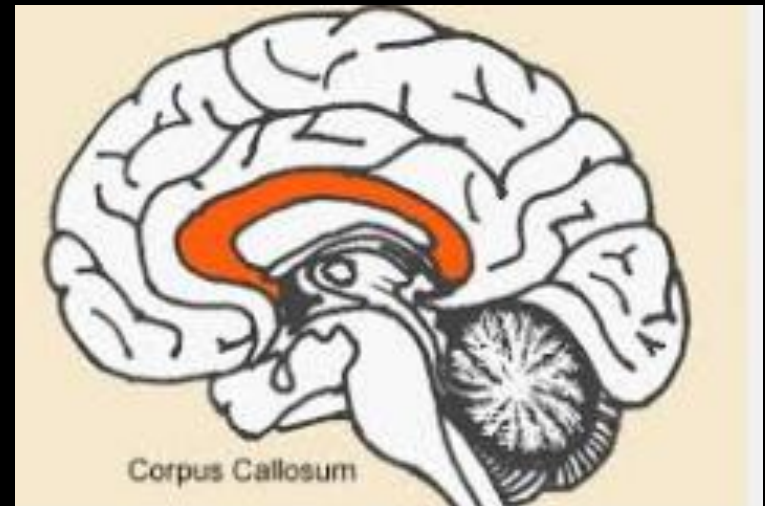
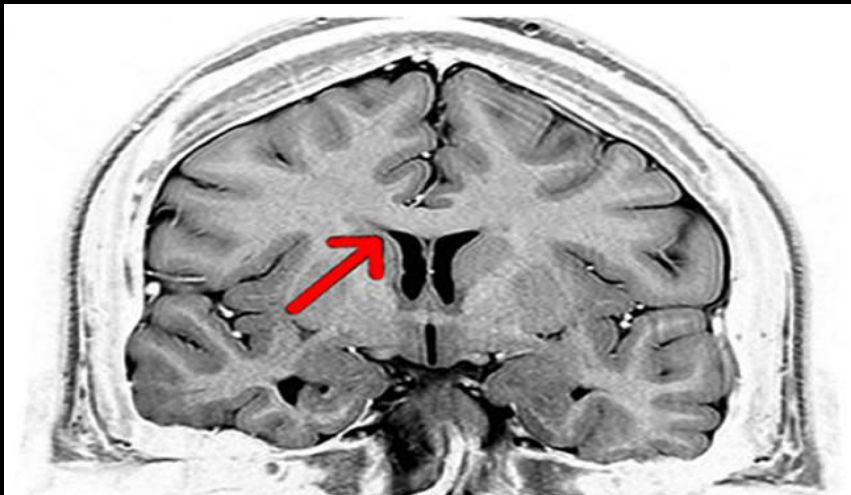
# Slide 2: Cerebrum: Left/Right Hemispheres



- How well does the image above describe **YOU**? Are you more "left-brain dominant" or "right-brain dominant"? Or are you a good mix of both? (I am "left-brain dominant"!! 😊)
- Make sure your slide includes: a photo with the **left and right hemispheres** labeled; and a **summary** about the **cerebrum**.
- Then, write whether you think you are left-brain dominant, right-brain dominant, or a mixture of both. Explain why you think this.

# Slide 3: Corpus Callosum

The left and right hemispheres have different functions, but they must **communicate** for maximum mental performance. A bridge-shaped band of nerve fibers called the **corpus callosum** (which means "body of hardness" in Latin) **connects** the two hemispheres. The nerve fibers in the corpus callosum allow the two hemispheres to **communicate with each other**.



# Slide 3: Corpus Callosum

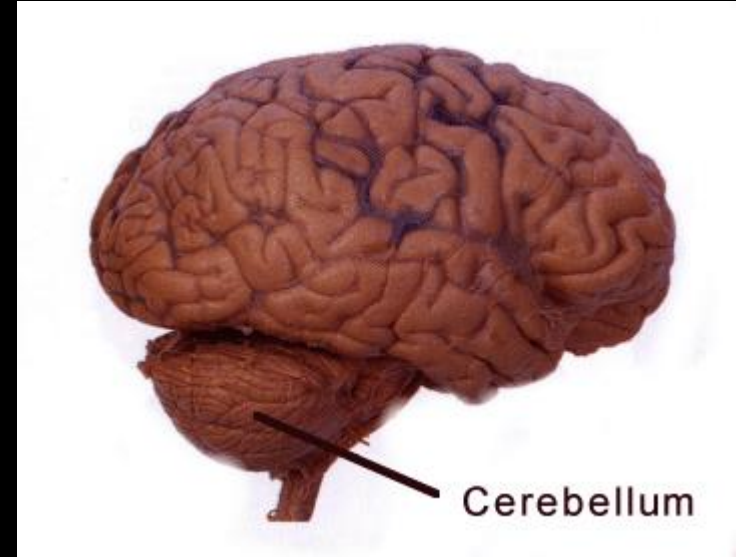
- Watch the Youtube video below. It shows the fascinating experiences of a man who had his corpus callosum severed (cut), so that both sides of his brain work independently, without communicating.

<https://www.youtube.com/watch?v=zx53Zj7EKQE>

- Make sure your slide includes: a photo with the corpus callosum labeled; a summary about the corpus callosum; and a short description of how cutting the corpus callosum affected the patient in the video.

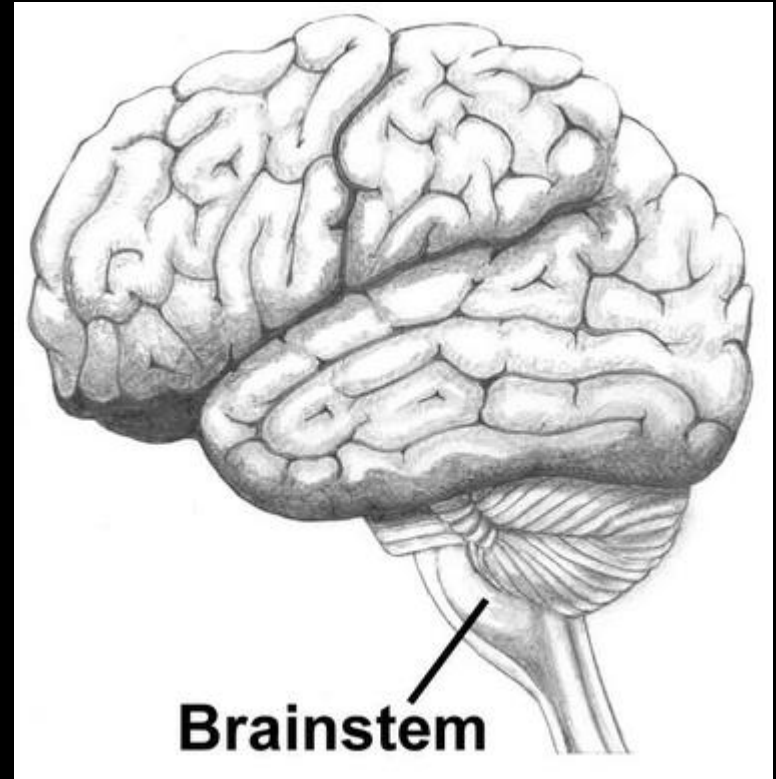
# Slide 4: Cerebellum

- The word **cerebellum** is Latin for "little brain". And, it looks like a "little brain" at the back of the "main" brain. The cerebellum plays an important role in **motor control** (balance and movement). It **receives input** from sensory nerves in the spinal cord, and uses them to coordinate your physical activity.
- People who have damaged their cerebellum often have trouble **keeping their balance** and **controlling their muscles**.
- The cerebellum also controls our ability to **talk**.
- Make sure your slide includes: a photo with the **cerebellum** labeled; a **summary** about the **cerebellum**; and a short summary describing how a person can be impacted if their **cerebellum** is damaged.



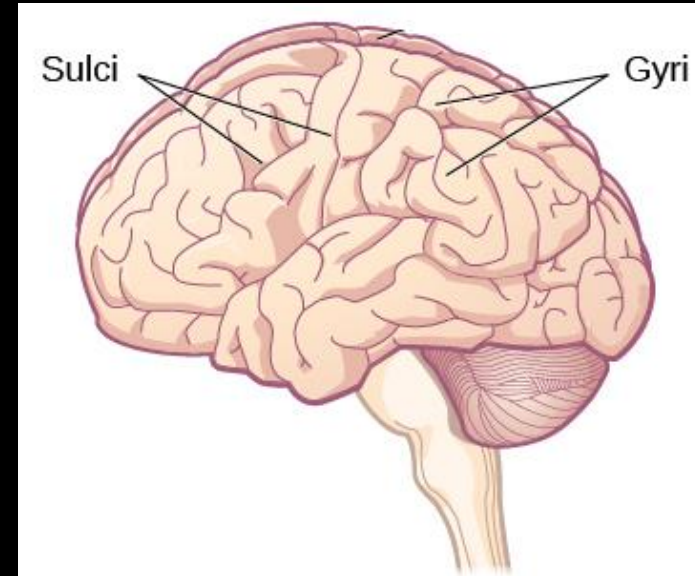
# Slide 5: Brain Stem

- The brain stem is kind of the "automatic pilot" of the brain. Located at the rear bottom of the brain, it connects the brain to the spinal cord.
- The brain stem regulates the autonomic nervous system, controlling all of the automatic things that you do without thinking (like breathing, heartbeat, blinking, and blood pressure.)
- Make sure your slide includes: a photo with the brainstem labeled; and a summary about the brainstem.



# Slide 6: Gyri & Sulci

- The hemispheres of the cerebellum are covered by tissue called the cortex. The cortex is only about 2-3 mm thick. The "wrinkles" on the cortex are called gyri. The grooves (that look like lines) between the gyri are called sulci. This is the Latin term for "furrow".
- The size of the human skull limits the size of the brain. In order to fit the maximum amount of brain matter inside the skull, the surface of the brain is folded into the wrinkles and grooves (gyri and sulci).
- This folding allows more brain tissue to fit inside the skull. If the cortex were ironed flat, it would be about the size of a pillowcase.





# Slide 6: Gyri & Sulci

- The gyri and sulci divide the cerebrum into four "lobes", or sections. Each lobe is responsible for different functions of the cerebrum.
- The frontal lobe controls reasoning, planning, emotions, and problem solving.
- The parietal lobe controls how we perceive touch, pressure, temperature, and pain.



Frontal  
Lobe



Occipital  
Lobe



Parietal  
Lobe



Temporal  
Lobe

# Slide 6: Gyri & Sulci

- The temporal lobe controls how we perceive hearing, and also coordinates our memory.
- The occipital lobe controls how we perceive vision.



Frontal  
Lobe



Occipital  
Lobe



Parietal  
Lobe



Temporal  
Lobe

- Make sure your slide includes: a photo with the gyri/sulci labeled; a summary about the gyri and sulci; and a description of each of the four lobes.

# You're Done!

- Please make sure that you have **carefully read all instructions**, to make sure that you have completed all required parts of this assignment.
- Turn it into **Haiku** to be graded.

