BRAIN MATCH
The human brain has many parts that control many different functions. These functions range from breathing to memory. In this activity, the student will learn different parts of the brain and their functions.

Background
The ancient Egyptians believed that the heart was responsible for emotions and thought. However, it is the brain that controls these activities, as well as all other body functions. The brain is a complicated organ that is made up of many different parts. Some of the parts and functions are:

Cerebrum: this wrinkled structure makes up the largest portion of the human brain. It is divided into 2 parts known as hemispheres. The right hemisphere controls the left side of the body and left hemisphere controls the body’s right side. Sight, smell, taste, touch, hearing, speech, thinking, planning, problem solving, emotion, memory, voluntary movement, and perception of pain are functions controlled by this structure.

Cerebellum: this area is located behind the brain stem. It is responsible for posture, balance, and coordinating movements so that they are not jerky or uncontrolled.

Brain Stem: this structure is located at the base of the brain. It is responsible for regulating heart rate, swallowing, breathing rate, sleep, and blood pressure. Opiates act on this structure to affect coughing, which is another function controlled by this part.

Limbic System: located deep within the brain, the limbic system is made up of many structures. The limbic system is an important memory center. Also, emotions are controlled here. For example, when opiates act on this group of structures, feelings of pleasure are produced.
Learning Objectives
The student will:
• Identify different parts of the brain.
• Play a game in which he/she matches brain parts with the actions they control.

Materials
• Brain Match Student Activity Sheet
• Parts of the Brain and Limbic System Transparencies
• index cards
• timers or clock

Procedure
1. Prior to class, make transparencies of the Parts of the Brain and the Limbic System diagrams. Also, make the “brain cards” students will need to play the “Brain Match” game that will be played later in this lesson. To make the cards, write the name of an action and the brain part that is primarily responsible for it on an index card (see the table in Step #2). Note: Some functions are associated with more than one brain part. Make sure you write down all the parts that are responsible for each function on the card.

2. Present the Parts of the Brain transparency to the class. As you point out each brain structure’s location and function, have the students fill in this information on the Parts of the Brain diagram in the student activity sheet.

<table>
<thead>
<tr>
<th>Brain Part</th>
<th>Activities Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebrum</td>
<td>sight, smell, taste, touch, hearing, speech, thinking, planning, problem-Solving, emotion, memory, voluntary movement, and perception of pain</td>
</tr>
<tr>
<td>Cerebellum</td>
<td>coordinated movement, balance, posture</td>
</tr>
<tr>
<td>Brain Stem</td>
<td>heart rate, coughing, swallowing, breathing rate, sleep, blood pressure</td>
</tr>
<tr>
<td>Limbic System</td>
<td>emotions, memory</td>
</tr>
</tbody>
</table>

3. Ask students what effect is produced when opiates act on the brain stem.
4. Next, present the *Limbic System* transparency. Note the location of limbic system relative to the cerebrum and the fact that it is made of many parts. Ask students what effect is produced when opiates act on the limbic system.

5. Tell the class that the Reconstructors are developing a game, “Brain Match,” to teach the public about the different parts of the brain and the functions/actions they control.

6. Next, have the students play “Brain Match.” The rules of the game are explained in the student activity sheet and are as follows:
   a. One student will act as the referee for a pair of competing teams. He/she will hand out the “brain cards” and keep time and score.
   b. Each team will have an equal number of players.
   c. The referee will give a player from Team #1 a “brain card” that has the name of a brain part and a function/action it controls. The player acts out the function.
   d. Team #1 has a maximum of five minutes in which to guess the function. Team #1 will receive one point for naming the function and one point for identifying a brain part that controls this activity. If Team #1 supplies only part of the required information, i.e., either the function OR a brain part controlling the activity, they will receive only one point, and Team #2 can score a point by supplying the missing information. If Team #1 fails to supply either the function or a part of the brain that controls the function being acted out, Team #2 can score 2 points if they can name the function and the part.
   e. Next, the referee will give a player from Team #2 a “brain card” to act out.
   f. The game play continues until all members of each team have acted out an activity at least once.
   g. The winner is the team with the highest score after an equal number of players from each team has acted out an activity.
**Episode Three: Teacher Guide**

**Extension Activities**

- *History*: Research how the functions of different parts of the brain were discovered.

- *Visual Arts*: Create a collage showing activities that are controlled by a particular part of the brain.

**Standards**

National Science Education Standards, Grades 5-8

- Science Content Standard C: All students should develop understanding of structure and function in living systems.

**Books**


**Pamphlets/Booklets**


**Web Sites**

- The Ancient Egyptian Heart
  [http://www.touregypt.net/featurestories/heart.htm](http://www.touregypt.net/featurestories/heart.htm)

- Neuroscience for Kids
  [http://faculty.washington.edu/chudler/neurok.html](http://faculty.washington.edu/chudler/neurok.html)

- Brain Briefings: From the Society for Neuroscience
**Episode Three: Student Activity Sheet**

**BRAIN MATCH**
Prepare yourself for the mind-boggling fun of “Brain Match”, the Reconstructors’ new science game. You’ll score big if you know the parts of the brain and what each controls. Good luck!

**Materials**
- “Brain cards”
- timer or clock

**Procedure**
1. Label the diagrams in the *Parts of the Brain* and *Limbic System* student activity sheets by writing in the name of each structure and the activities it controls. Review this information prior to playing “Brain Match”.

2. To play “Brain Match”:
   a. Divide into two teams. Each team has an equal number of players.
   b. A student who is not a member of any team will act as referee. His/her job will be to hand out the “brain cards” and keep time and score.
   c. A player from Team #1 gets a “brain card” from the referee. It has the name of a brain part and an activity it controls. The player acts out the activity.
   d. Team #1 has a maximum of five minutes in which to guess the activity that is being acted out. It will receive one point for naming the activity and one point for identifying the brain part. If Team #1 supplies only part of the required information, i.e., either the function OR a brain part controlling the activity, they will receive only one point, and Team #2 can score a point by supplying the missing information. If Team #1 fails to supply either the function or a part of the brain that controls the function being acted out, Team #2 can score 2 points if they can name the function and the part.
   e. Next, a student from Team #2 takes a “brain card” and acts out the activity on the card.
   f. Play continues until all members of each team have acted out an activity at least once.
   g. The winning team is the one with the highest score after an equal number of players from each team has acted out an activity.
Parts of the Brain

cerebrum

brain stem

cerebellum
**Episode Three: Student Activity Sheet**

**Limbic System**

- cerebrum
- limbic system
- brain stem
- cerebellum