Make Up Your Mind: Brain Cap Activity
Activity 1B

Activity Objectives:
Using paper templates, students will construct a three dimensional model of the exterior and interior of the brain. Students will be able to:

- Identify the cerebrum, cerebellum, and medulla
- Observe how the lobes of the brain lobes fit together
- Identify major lobes of the cerebral cortex
- Observe a portion of the spine, spinal cord, and spinal nerves
- Observe how structure and function are related in the brain

Activity Description:
Models are a motivating, effective and fun way to improve knowledge and promote self-directed learning. Students visualize and reflect as they construct models. In this activity, as they **"Make up Their Minds"**, your students will assemble a brain cap that will allow them to examine basic brain anatomy.

As they construct the brain cap, students will use templates provided in the teacher section of this activity along with processing out information from **Activity 1A *A Piece of Your Mind: Brain Anatomy***. They will color, label, and list the function of each part of the brain. Next, students will cut out and construct their brain cap.

Activity Background:
This activity is designed to appeal to multiple intelligences as basic brain anatomy comes alive for students. This activity builds upon the work done in **Activity 1A *A Piece of Your Mind: Brain Anatomy***. It will appeal to kinesthetic, spatial, and logical/mathematical intelligences as students construct a model of the exterior of the brain. Students will also construct nerve pathways and a model of how the nerves join in the brainstem and travel down the spinal cord through the vertebrae.

More in depth background information on brain anatomy is provided in **Activity 1A *Piece of Your Mind: Brain Anatomy***, http://teachhealthk-12.uthscsa.edu

Materials:
- Brain Cap Templates *(provided after this teacher section of the activity)*
- Completed Brain Cap as an Exemplar
- Colored pencils or markers
- Scissors

Activity Overview

The Brain: It's All In Your Mind

LESSON 1
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- Tape
- Glue
- *Student Activity Pages* from **Activity 1A** ***A Piece of Your Mind: Brain Anatomy***
- 1 copy of *Processing Out Pages* of this activity per student

Activity Instructions:

1. Cut out the Brain Cap Templates and assemble according to directions on the templates.
2. After students have completed their Brain Caps and are wearing them, engage in a whole group review of the structure and function of the brain. Cut the paper strips provided after this section into pieces. Place them into a container. Draw one strip at random and read the text out loud. Students should point to the part of the brain involved. Continue until all strips have been used. Repeat as needed for practice.

Management Suggestions:

- Divide students into groups of 2 to complete the activity
- Have all supplies ready prior to beginning the activity
- A *slideshow* is provided on the website to help teachers process out the activity with students
- Alternately, teachers can use this activity as an assessment tool

Suggested Modifications:

Teachers can demonstrate how to assemble the brain cap for students needing assistance

Suggested Extensions:

- Cooperative learning activity allowing students to role play areas of the brain and have class guess what area they represent
- Ask students to choose a part of the brain and design an advertisement to convince people that their part of the brain is the most important.

References Used:

Abu-sitta, SA; Shalaby, MA; Hajek, J. (1984). The value of student-made models as learning aids in physiology. *Medical Education*, 5, 326-330.

Cohen, BJ. (2005). Memmler's structure and function of the human body 8th ed. Baltimore, MD : Wolters Kluwer Health/Lippincott William & Wilkins.

Gilbert, JK. (2007). Visualization in Science Education: Models and Modeling in Science Education , Vol. 1. New York: Springer Publications.

Brain Cap Templates on following pages.

Thinking

Vision

Planning

Emotions/Feelings

Hearing

Balance

Protects Spinal Cord

Controls Heart

You imagine a new type of iPOD

Receives pain messages

You talk to your friend

Coordination of movement

Activity Overview

The Brain: It's All In Your Mind

LESSON 1
ACTIVITY 1B

Activity "Administrivia":

Intended Grade Level:

6 – 8

Key Concepts:

Basic brain anatomy

Process Skills Utilized in Lesson:

Summarization, extracting key facts, model building, concept attainment

Previous Learning Assumed:

Parts of the brain and their functions

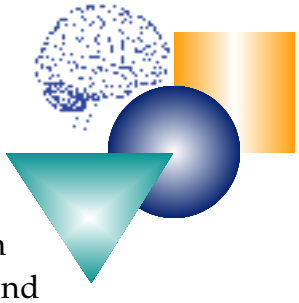
Relevant TEKS

6.5 The student knows that systems may combine with other systems to form a larger system.
(B) describe how the properties of a system are different from the properties of its parts.
6.10 The student knows the relationship between structure and function in living systems.
(A) differentiate between structure and function
(B) determine that all organisms are composed of cells that carry on functions to sustain life.
(C) identify how structure complements function at different levels of organization including organs, organ systems, organisms, and populations.
7.5 The student knows that equilibrium of a system may change.
(A) identify the systems of the human organism and describe their functions.
8.6 The student knows that interdependence occurs among living systems.
(A) describe interactions among systems in the human organism

Key Words for Web Page:
brain anatomy, cerebral cortex, cerebellum, brain stem, diencephalon, lobes of the brain, structure and function

Make Up Your Mind: Brain Cap Activity

Student Activity 1B



Introduction:

Today, as you **"Make up Your Mind"**, you will be building a brain cap model of your brain. Your brain cap will allow you to further examine the basic brain anatomy you have been studying. Today you will see the exterior structures and how they fit together.

Background:

In ***A Piece of Your Mind: Brain Anatomy*** **(Activity 1A)**, you learned about the different structures of the brain. You also learned about the functions of the different parts. You will use your skills today to assemble a brain cap.

Materials:

- Brain Cap Templates
- Colored pencils or markers
- Scissors
- Tape
- Glue
- ***Student Activity Pages*** from **Activity 1A** ***A Piece of Your Mind: Brain Anatomy***

Instructions:

1. Using your text, lesson 1A, or the slideshow shown by your teacher, write the main function of the structure below each label on the brain cap.

2. Cut out the brain diagrams.

3. Tape or glue the tabs together, *A* matches *A*, B matches B. Follow all directions on the template.

4. Tape or glue yarn to appropriate areas of the underside of the cap, having them trail out underneath the brainstem.

5. Add the **"vertebrae"** column, taping it together, and have the yarn trail out.

6. **Try on your cap!**

7. Your teacher will call out some tasks handled by different parts of the brain. Your job is to point to the part of the brain that controls the task.

Make Up Your Mind: Brain Cap Activity

Processing Out Activity 1B

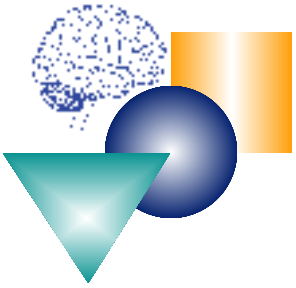
1. Why do you think the brain is designed to handle some tasks, such as keeping your heart beating, without your having to think about it?

2. Rather than being located randomly throughout the brain, neurons that do a particular job are arranged in lobes. Why might this arrangement be more efficient?

3. Wrinkle up a piece of notebook paper and observe what happens to its size. Now, consider the wrinkled surface of the **CEREBRUM**. How might the wrinkled surface affect the number of neurons in this portion of the brain?

4. Compare the **CEREBELLUM** with the **CEREBRUM**.
   a. How are they similar?

b. How are they different?



c. Put your responses into the **Venn** diagram below.

CEREBELLUM

CEREBRUM

SIMILARITIES

5. In this activity, you have seen a model representing how the nerves from the brain come together in the **BRAIN STEM** and continue down through the vertebrae as the spinal cord. Spinal nerves branch out from different areas of the spinal column through the vertebrae. What do you think is the purpose of this branching?