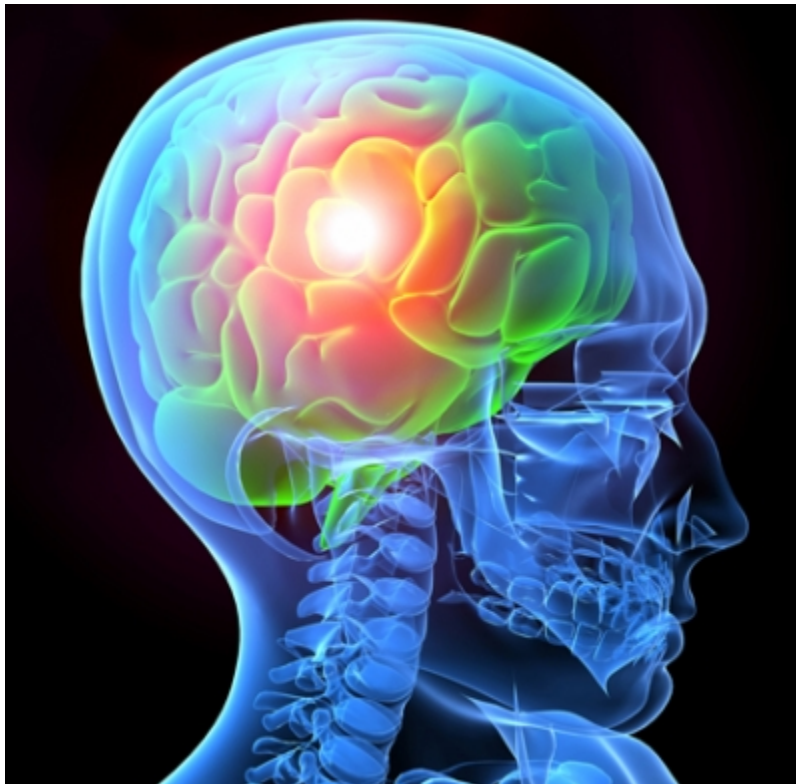




UNIVERSITY OF
NEW ENGLAND

Center for Excellence
in the Neurosciences

CEN Outreach
Integrated Elementary Module



Module Demonstrations and Components:

- Children's Book (K-2: Franklin Book and 3-5: Your Fantastic Elastic Brain)
- Egg Drop or Melon Drop Brain Safety Simulation
- Helmet Safety Fitting Demonstration
- Lobes Coloring

Learning Goals and Design for Each Module Component

These activities may serve as a guide for instructors to use, feel free to create your own to demonstrate different neurological functions or to better explain these same concepts. These demonstrations can be used as standalone activities but are often presented in succession to better reinforce each concept.

For information on concussions, please visit this website:

http://www.cdc.gov/concussion/pdf/athletes_Eng.pdf

Children's Book

Franklin Book

Teaches children:

- A helmet can help protect our brain
- Your helmet needs to fit you right
- When your helmet no longer fits, you need to get a new one
- You need be able to buckle your helmet

Your Fantastic Elastic Brain

Teaches children:

- Your brain has different parts
- It helps you think, learn, read, see, move, dance, talk, etc.
- Your brain is responsible for the five senses: sight, hear, smell, touch, and taste.

Egg Drop

Students should be able to understand the connection between the fragile state of the human brain against impact with and without the aid of Cerebral Spinal Fluid (CSF). This will be achieved by dropping an egg (human brain) in a container (human skull) in two trials, one with water in the container (CSF) and one without the aid of the stimulated CSF. The goal of this module is to demonstrate a basic function of the neuroanatomy. Instructors may be able to introduce the effectiveness of helmets during this demonstration as well, depending on the age group of the students.

Melon Drop

Students should be able to understand the importance of helmets during high impact sports and activities. This demonstration involves the use of two trials. The first trial includes a helmet placed around a melon fulfilling the role of a human skull. This “skull” and helmet are then thrown against the ground by the student to show how the helmet takes the brunt of the impact and the melon remains intact. To show the contrary to this model, the students are then permitted to throw the second melon against the ground without the helmet, with mats placed on floor to accommodate the ensuing destruction. The demonstration is designed to show students how the brain, and in this case the skull, are fragile and with the aid of helmets, they can prevent serious traumatic brain injuries. Instructors can preface this component with polling the students about any TBI’s they, or someone they know, may have experienced. They may also follow up on this demonstration with the cranial nerve examination.

Helmet Safety Fitting

This component is designed to show students the proper way to fit a helmet. The students may volunteer to show how they personally wear a helmet or the instructor may demonstrate the different, incorrect ways to fit a helmet, focusing on how an impact while wearing the helmet the wrong way may injure them. The instructor may then demonstrate the correct fitting, focusing on keeping the strap in the correct place, and the helmet centered on the head to provide maximum protection. The goal of this demonstration is to enlighten students on how to wear a helmet in such a fashion that they are the best protected against impact. It is also important to touch upon the fact that a new

helmet should be purchased after any kind of impact that could have weakened the structure of the helmet.

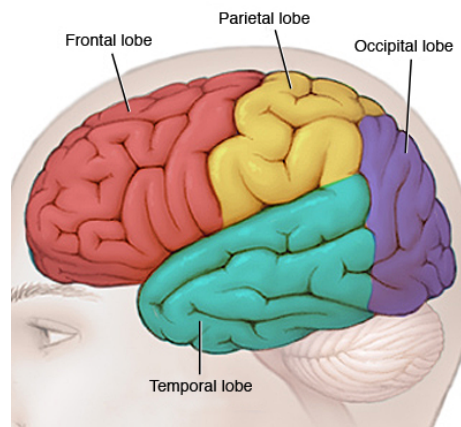
For helmet fitting instructions, see this website:

<http://www.nhtsa.gov/people/injury/pedbimot/bike/easystepsweb/>

- **Discussion of “different brain regions do different things”**

- Discussion of lobes and function

1. **Frontal Lobe:** Located on the front of the brain. It is used in decision making, some muscle movement
2. **Parietal Lobe:** Located on the top of the brain. Used for sensation (touch), and integration of all senses.
3. **Temporal Lobe:** located on the sides above the ears. They are for hearing and memory.
4. **Occipital Lobe:** Located on the back and it is used for sight (vision)



- **Pipe Cleaner Neurons**

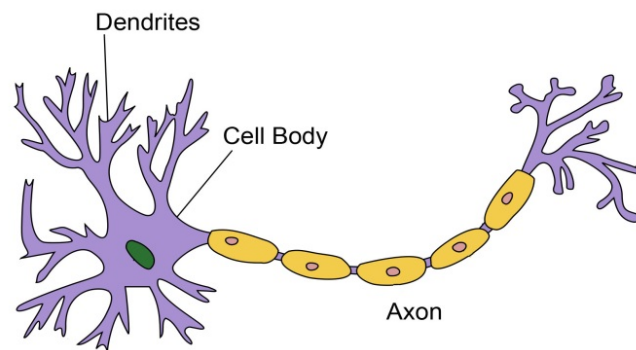
- Neurons

- Your body is made up of cells.
- There are many different types of cells that work for different parts of your body.
- Neurons are cells of the brain and nerves in your body.

- Parts of a Neuron:

- **Soma:** the body of an organism, or the “cell body”.
- **Axon:** A long, slender projection of the neuron that conducts electrical impulses away from the soma.

- **Dendrite:** The branching process of a neuron that conducts the electrical signal toward the cell.
- **Myelin Sheath:** A special type of cell that wraps around the axon to insulate and deliver it faster.
- The signal enters the dendrites and is sent down the axon.



- **Repeated Maze Activity**

- The first time attempting to complete the maze takes longer than the first attempt.
- It takes less time to complete the maze once you have already done it because the more times you complete a task, or repeat the task, the more information your brain will retain.



- Repeating tasks will make you become better at completing them.

- **Stroop Test**

- The words of the Stroop Test have a strong influence on the ability to say the color. The interference between the different information your brain receives causes a problem. There are two theories that may explain the Stroop Test.
 - **Speed of Processing Theory:** the interference occurs because the words are read faster than the colors are named.
 - **Selective Attention Theory:** the interferences occur because naming colors requires more attention than reading the words.
- The puzzle may be easier for a young child than an adult because younger children may know their colors but they cannot yet read.

CARD # 1				
RED	YELLOW	ORANGE	BLACK	GREEN
PINK	BLUE	BROWN	GRAY	BLACK
BLUE	RED	GREEN	ORANGE	RED
GRAY	YELLOW	PINK	BLUE	BROWN
ORANGE	GREEN	BLACK	RED	GRAY

CARD # 2				
RED	BLUE	GREEN	BLUE	BLACK
YELLOW	GREEN	ORANGE	GREEN	RED
PINK	BLACK	BROWN	YELLOW	GRAY
BLUE	RED	GREEN	PINK	BROWN
ORANGE	BLACK	BLUE	GREEN	RED