How is the Brain Organized?

Module 4
The Brain

How much do you know about YOUR brain??

Structures of the brain

True or False? We Only Use 10% of Our Brain
What observations can you make about the brain?

The increasingly complexity of the human brain comes from new brain systems built on top of the old.

The Brainstem is the oldest region of the human brain.
- The Medulla controls basic body functions - heart beat, digestion and breathing.

The "Old" brain
- These structures tend to be responsible for basic,

The Primitive Brain
- The increasingly complexity of the human brain comes from new brain systems built on top of the old.
Cerebellum

- "Little brain" – attached to back surface of brain stem.
- It helps coordinate

- Allows you to walk a straight line

The “Old” Brain

- The reticular formation (RF) is a finger-shaped nerve network in the brainstem that plays an important role in controlling arousal.

- It is involved in behaviors such as walking, sleeping, and turning to attend to a sudden noise.

- The Thalamus is a large structure of forebrain that processes sensory information from the CNS before it reaches the cerebral cortex.
Not the old, but not quite the new.

- The Limbic System is a neural system located below the cerebral hemispheres;
  - This is the “pleasure center” of the brain

The Hippocampus

- The hippocampus has a special role in
  - Individuals who suffer extensive hippocampal damage cannot retain any new conscious memories after the damage.
The Amygdala

- The Amygdala consists of two lima bean-sized neural clusters linked to the emotions
  - Associated with fear and rage, including the perception of these emotions and the processing of emotional memories.

Charles Whitman

- A student at University of Texas in 1966.
- After killing his Mother and wife, he used a high-powered rifle and killed 14 people, wounded 32 others, from the top of the campus observation tower.

The Hypothalamus

- The Hypothalamus is a pea-sized structure that controls many complex behaviors such as
  - Linked to emotion and reward.
This small structure regulates a variety of complex behaviors. If you have trouble remembering what this structure does try this...

The FOUR F’s...
Research has shown that rats who received electrical stimulation will repeatedly press a lever which activates this region-producing pleasure (Olds & Milner, 1954).

Recent research suggests that there is a link

Can pleasure become addicting?
The “Newer” Brain

- The __________________________ (cerebral cortex) of the brain is comprised of interconnected neural cells that covers the cerebral hemispheres.

- The brain is divided into 2 hemispheres

The hemispheres of the brain are connected

- The Corpus Callosum connects these hemispheres and allows ________________________ ________________________ ________________________

Damage to the Corpus Callosum results in two independent brains in one skull

Split brain patients allowed researchers to discover “hemispheric specialization”
This research showed that each hemisphere of the brain is specialized:
- The right brain is associated with ____________________
- The left brain is associated with speech and language.
  - Broca’s area – ____________________
  - Wernicke’s area – ____________________

Next....More Brain, Please!

The four lobes of the cerebral cortex!