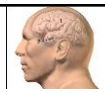
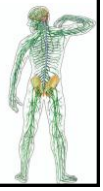


How is the Brain Organized?



Chapter 3
Biological Foundations of Behavior

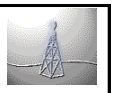
Class Objectives

- What are the 3 divisions of the brain?
  - Hind-brain
  - Mid-brain
  - Forebrain
- What structures are in the brain and what are their functions?

2

CNS Communication

The Spinal Cord



- The spinal cord transmits signals from the sensory organs, muscles and glands to the brain.

3

The spinal cord is like a

_____

_____

between the brain and the rest of the body.

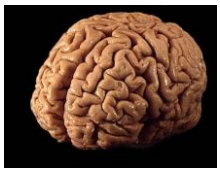
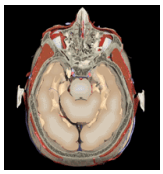
4

Spinal cord communication

- Communicates with the body below the head through *sensory* and *motor neurons*
- Sensory neurons _____
  Carry information about touch, pain, and other senses from the periphery of the body _____
- Motor neurons _____
  - Transmit impulses _____ the central nervous system to the muscles and glands

5

What observations can you make about the brain?

6

Looking at the Brain

- _____
  _____
  _____
- The brain is divided into **2 hemispheres**
  - Right and left hemispheres

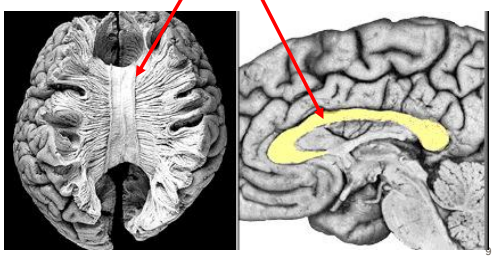
7

The hemispheres of the brain are connected

- The _____ connects these hemispheres and allows communication from one side of the brain to the other.

8

Corpus Callosum



9

- Damage to the Corpus Callosum results _____
_____
- *Split brain patients* allowed researchers to discover _____

10

Split Brain Research

- This research showed that each hemisphere of the brain is *specialized*
  - The *right brain* is associated with musical _____
_____
  - The *left brain* is associated with speech and _____

11

Hemispheric Specialization

Left Brain

- Controls Right Side of Body
- Right Side Visual Field
- Speaking
- Reading
- Logical Thinking
- Analytical Skills
- Sequential Processing

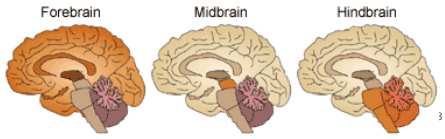
Right Brain

- Controls Left Side of Body
- Left Side Visual Field
- Spatial Processing
- Facial Recognition
- Music
- Emotional Expression
- Holistic Thinking

12

Three Divisions of the Brain

- Hindbrain
- Midbrain
- Forebrain



3

The Hindbrain

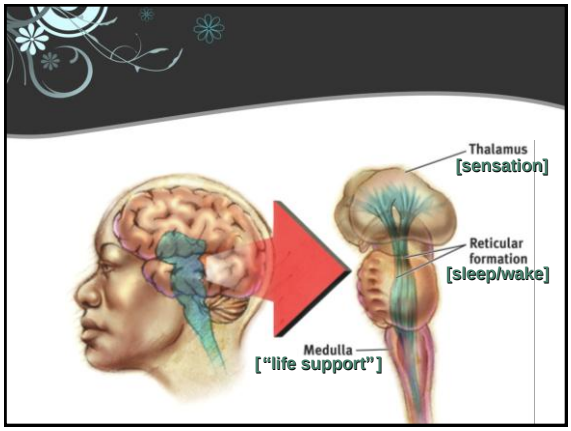
- _____
  _____
- The structures in the lower brain tend to be responsible for basic, _____
- Includes the Cerebellum, Pons, and Medulla

14

The Hindbrain

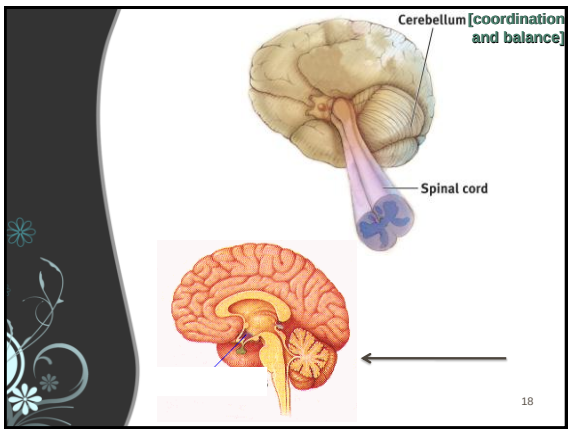
- The Medulla is the most primitive and lowest _____
  _____
  - It controls basic body functions- heart
    _____
    _____

15



- Pons- provides link ("bridge")between the medulla and the cerebellum and rest of brain
- Cerebellum- "Little brain" – attached to back surface of brain stem.

17



18

The Midbrain

- This is an area in which many nerve-fiber systems ascend and descend to_____

  - The midbrain relays information between the brain and the _____ and coordinates our visual and auditory reflexes.

The **reticular formation** (RF) is a finger-shaped structure that runs through the hindbrain and midbrain.

19

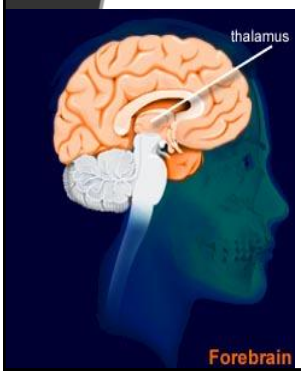
The Forebrain

- This the largest, most complicated and most advanced brain division.
- This area of the brain is associated with _____

  - The ability to concentrate, elaboration of thought, judgment and inhibition.

20

Forebrain

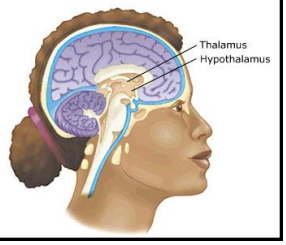


- The *Thalamus* is a large structure of forebrain that acts a routing _____
- Processes sensory information from the _____

21

- *The Hypothalamus* is a pea-sized structure that controls many complex behaviors such as_____

_____



Food

23

Fight

24

Flight

FLEE

It is always good to escape those pesky random battles.

And…Ummm….

26

Where do my emotions come from?

- The *limbic system* is an interconnected group of structures that are especially
  - This is referred to as the "pleasure center" of the brain
- The limbic system also includes the *hippocampus* and *amygdala*

27

The Hippocampus

- The *hippocampus* has a special role in _____
  - Individuals who suffer extensive hippocampal damage cannot retain any _____ _____
- This area seems to help us _____ _____ _that were used when we originally encountered the information (Trinkler & others, 2009).

28

The Amygdala

- The *Amygdala* is involved in the discrimination of objects that are necessary for the organism's _____
  - _____ _____
- The _____ _____
  - In humans, damage to the amygdala can result in an inability to recognize facial expressions of distress.

29

Can pleasure become addicting?

- _____ _____ _____
  - The rats will choose to press the bar in preference over food and water, eventually dying from exhaustion!

Recent research suggests that there is a link _____ _____ _____

30

More Brain Next Class!

The four lobes of the cerebral cortex!

31