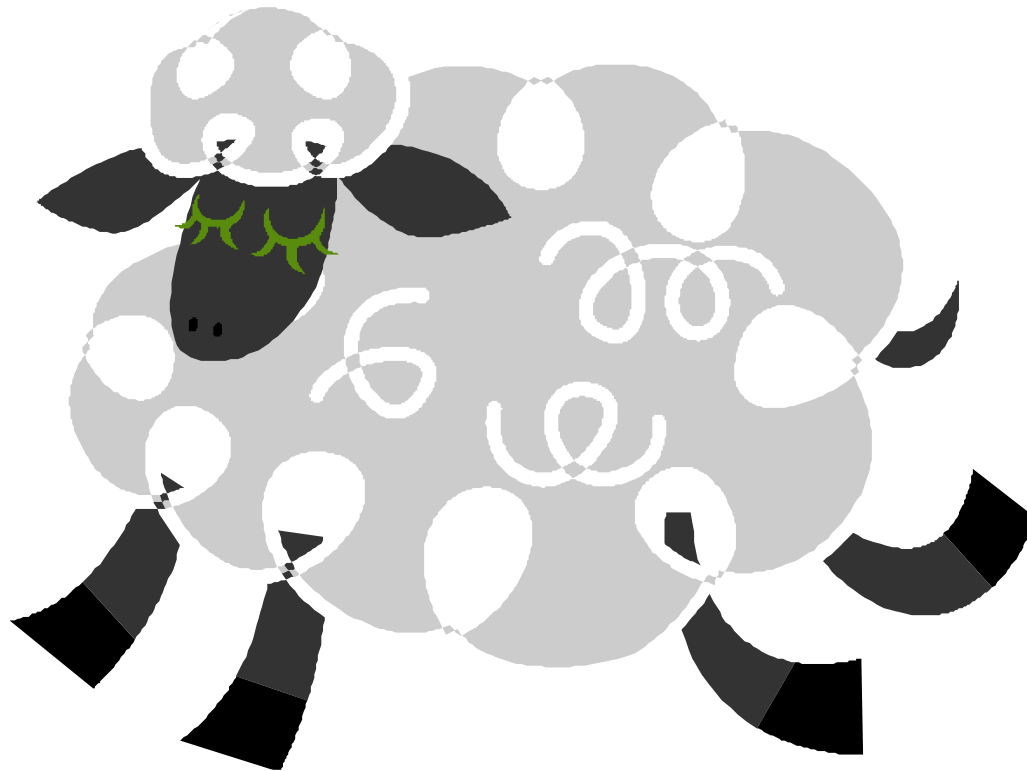


Sheep Brain Observation Guide



How to use this PowerPoint:

- Put in slideshow mode to make the pictures as large as possible (press F5)
- Make sure someone with **CLEAN HANDS** advances the slides
- Keep the computer **DRY!**



I searched for clipart sheep in Word and this is one of the pictures that comes up! What the...?

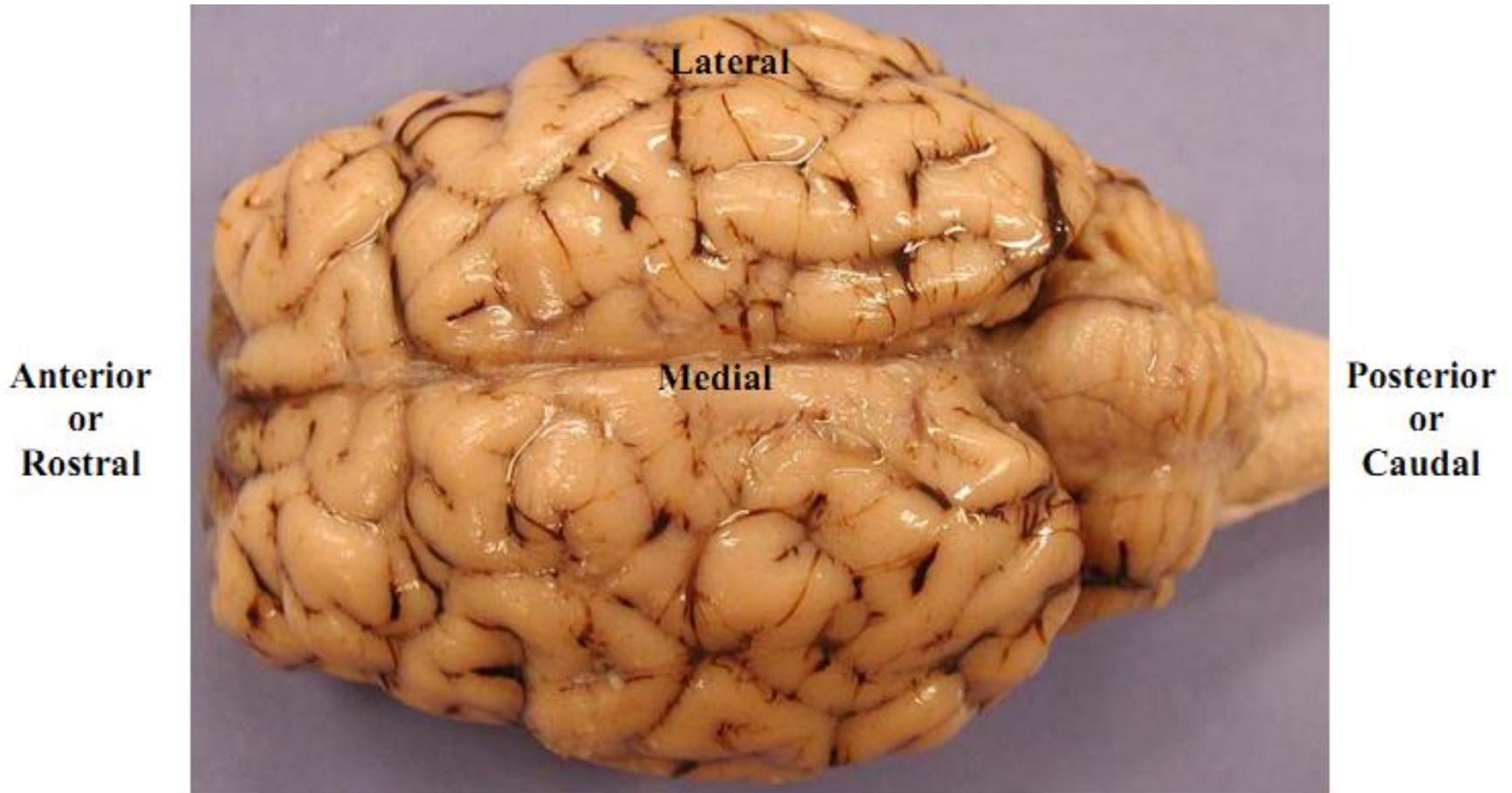
Gather materials

- Gloves
- Apron (optional)
- Dissection tray
- Half sheep brain (I re-use these, so DO NOT destroy them!!!)
- Partner



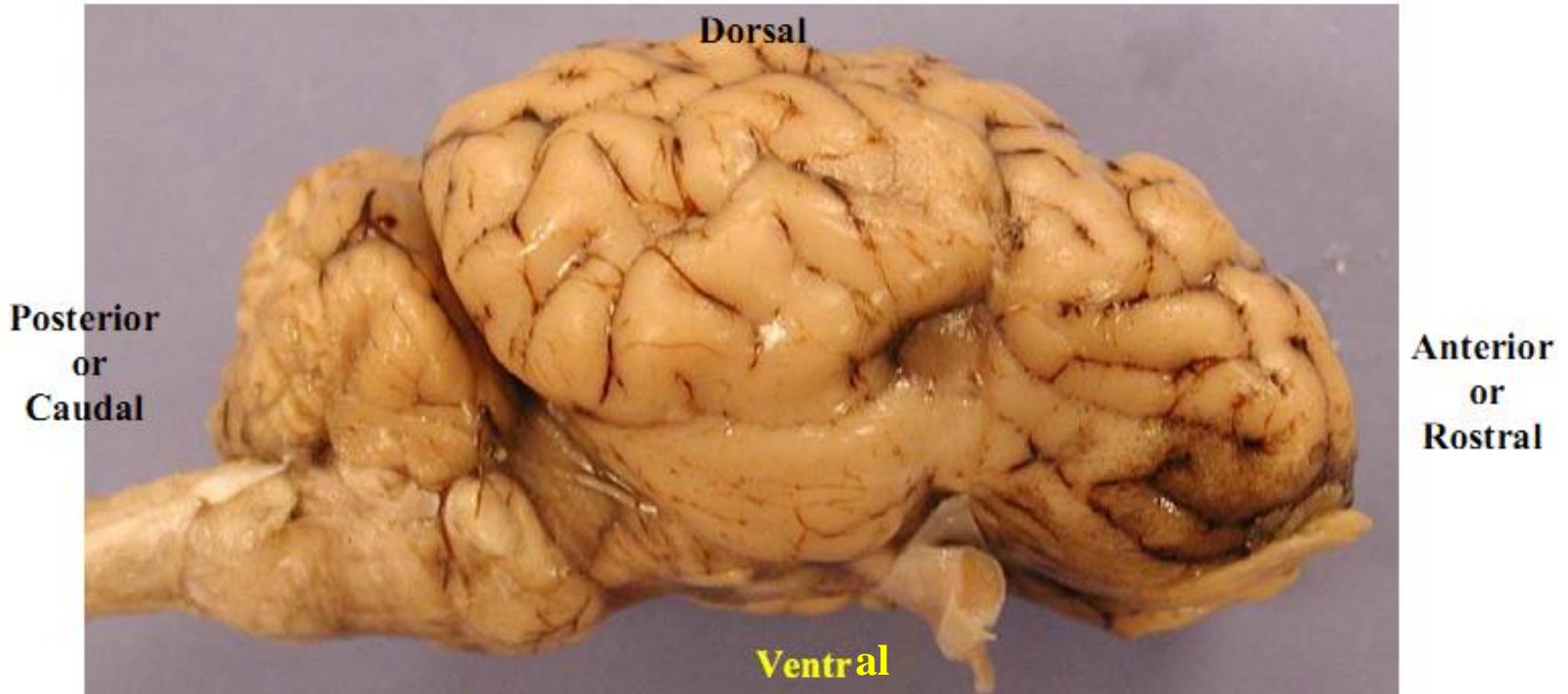
Note: directional terms

Slightly different in 4-legged animals



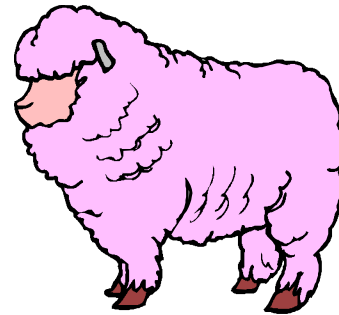
Note: directional terms

Slightly different in 4-legged animals



Brain anatomy

- Decide if you have a right or left hemisphere.



Did you know that you can get pink cotton from pink sheep? Yeah, it's just like how you get chocolate milk from brown cows.

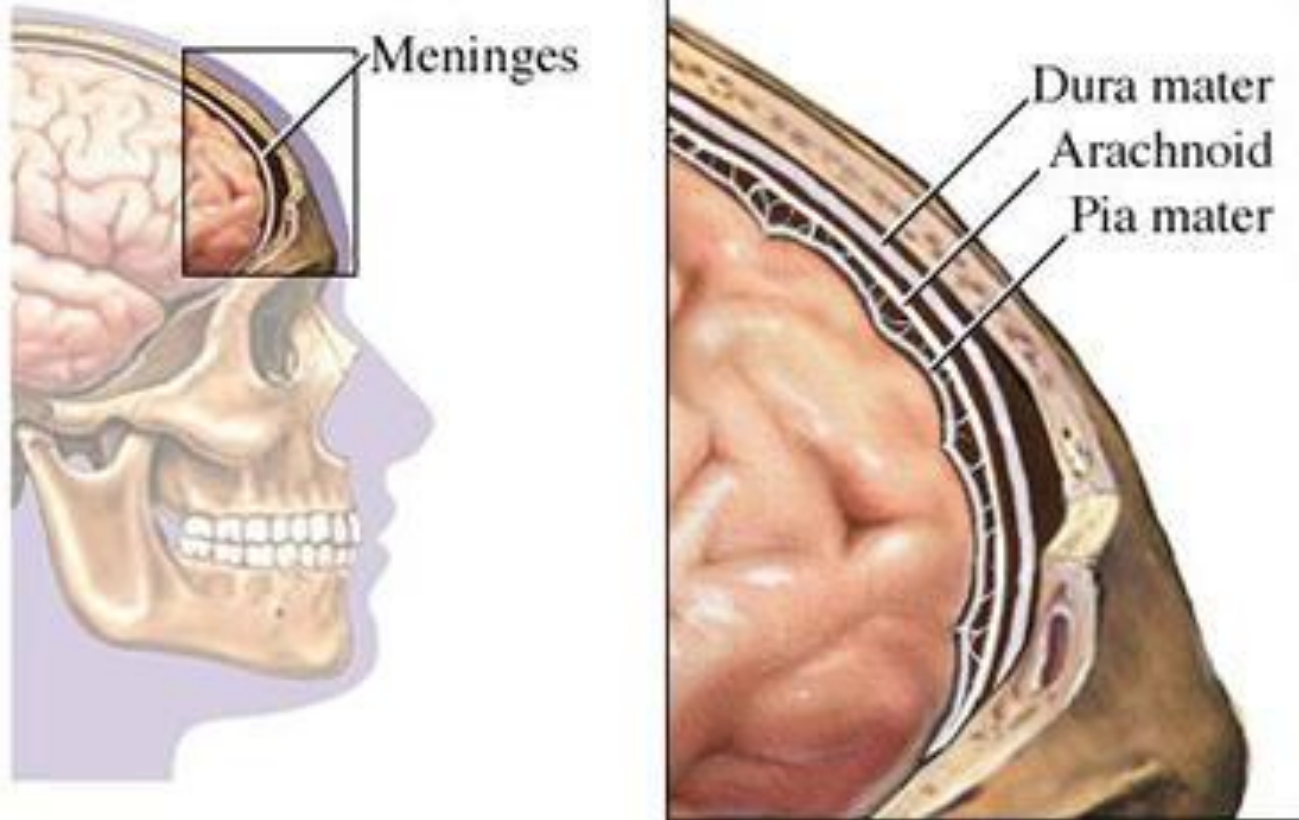
Question 1

- On your lab sheet, draw lines to show where a cut for a **sagittal plane** and a **frontal/coronal plane** would be. Clearly label your lines.



FUZZY!!!

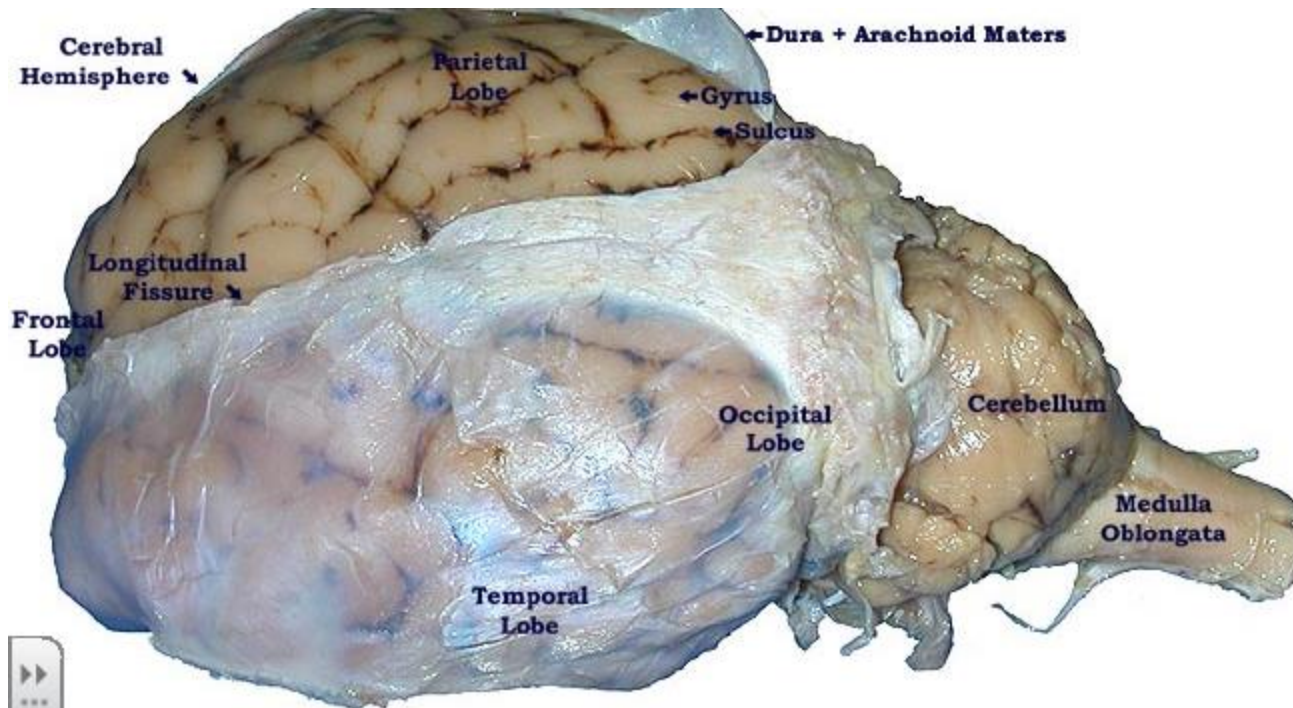
Note: Meninges of the Brain



Brain is protected by the skull and 3 layers of membranes called meninges.

Observe Meninges

- Your brain will **not** have the tough, outer coat, or the **DURA MATER** (literally means “tough mother”).
- You also probably will not have the stringy, web-like **ARACHNOID MATER** (“spider mother”) because it is found beneath and stuck to the dura mater.



Observe Meninges

- The space under the arachnoid, the **subarachnoid space**, is filled with **cerebrospinal fluid** and contains blood vessels.
- You **WILL** be able to see the **PIA MATER** (“tender mother”). It follows the ridges (gyri) and valleys (sulci). Look for a “gap” in the membrane and you should be able to see it better.



Questions- use notes if needed

2. What is the function of the meninges?

3. Describe the following meninges:

Dura mater, Arachnoid mater, and Pia mater

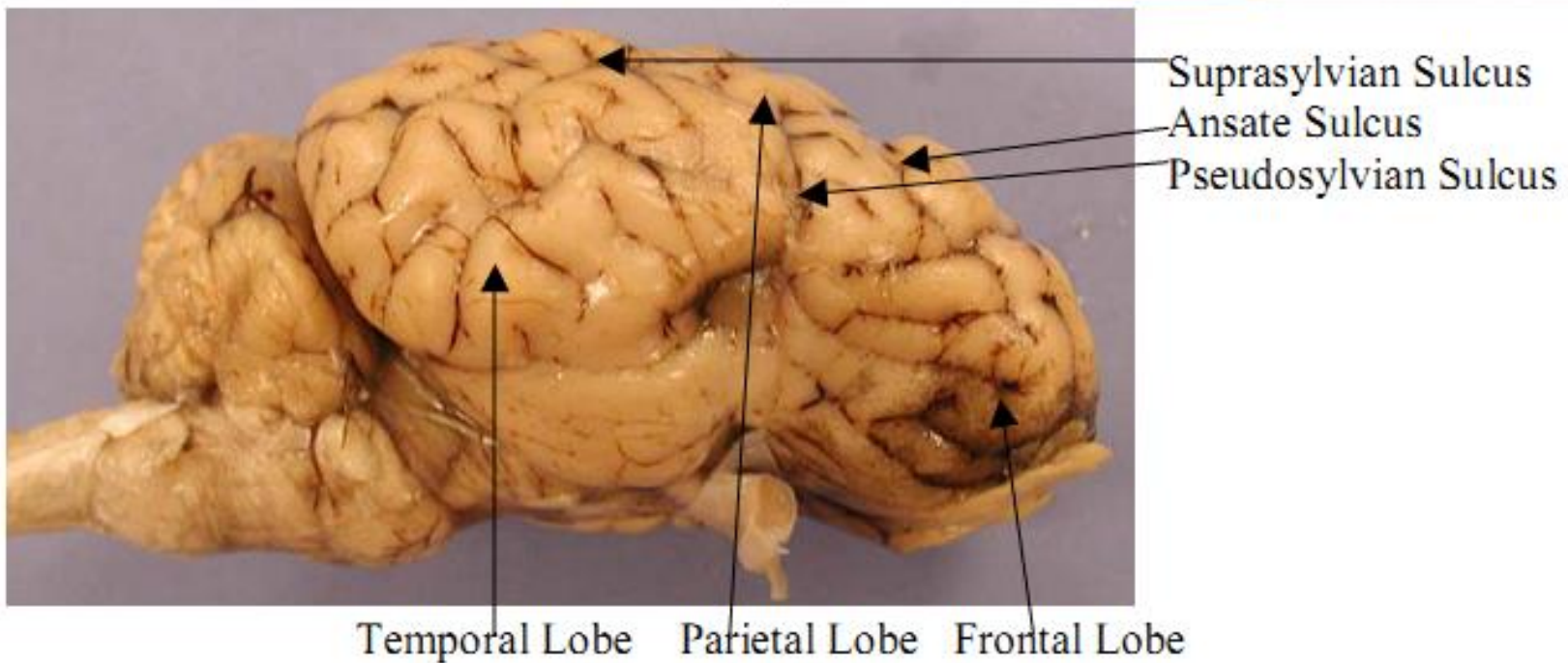
4. What is meningitis?



I'd call her a Tough Mother...look at that balancing act!

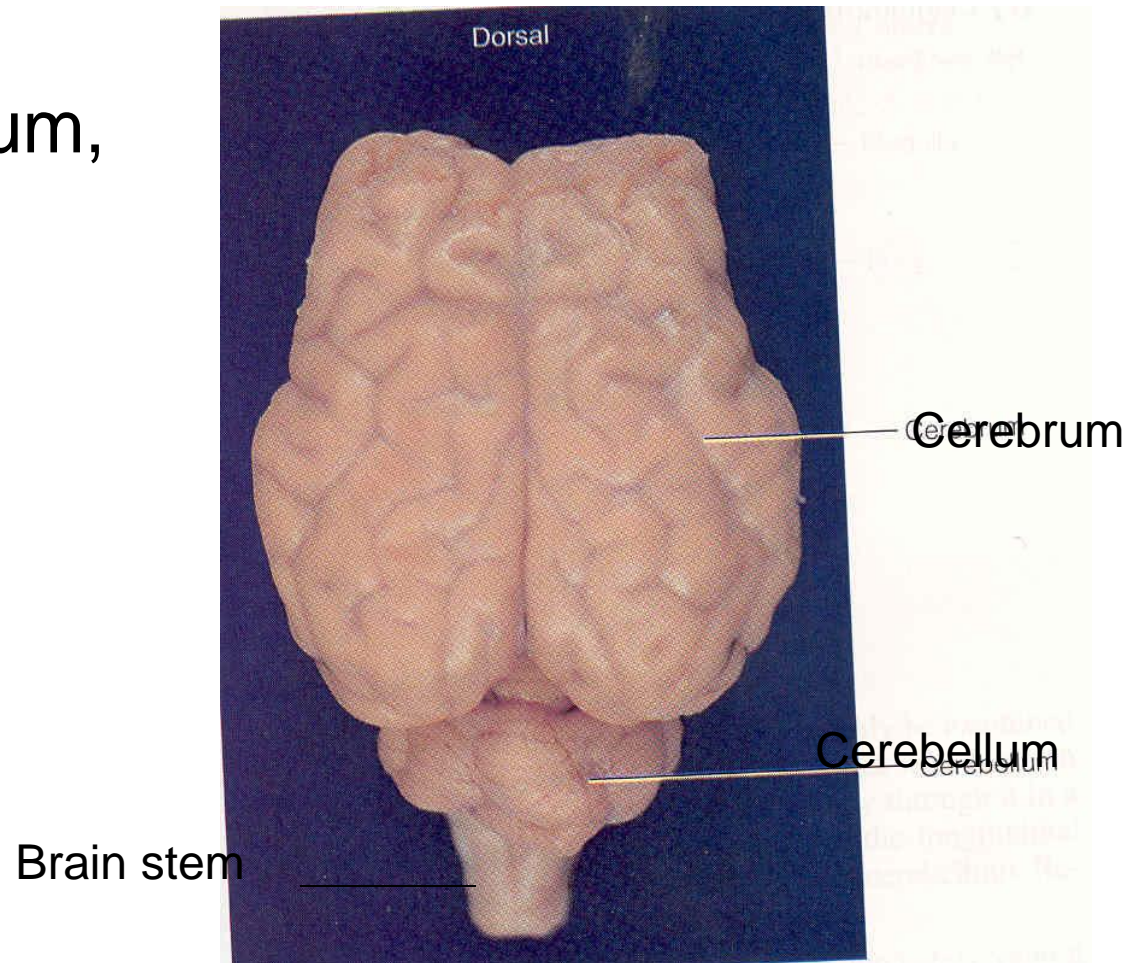
Back to the brain!

If you would like, feel the gyri and the sulci.
Note that some sulci have special names.



Even though you only have half, you can still identify these features.

- Identify the cerebrum, brainstem, and cerebellum



Question 5

Of the 3 things you just identified on the previous slide, match each to the following functions:

- a) Balance
- b) Breathing
- c) Hearing and Vision



Shaving with a paint brush probably isn't very effective.

Human vs Sheep

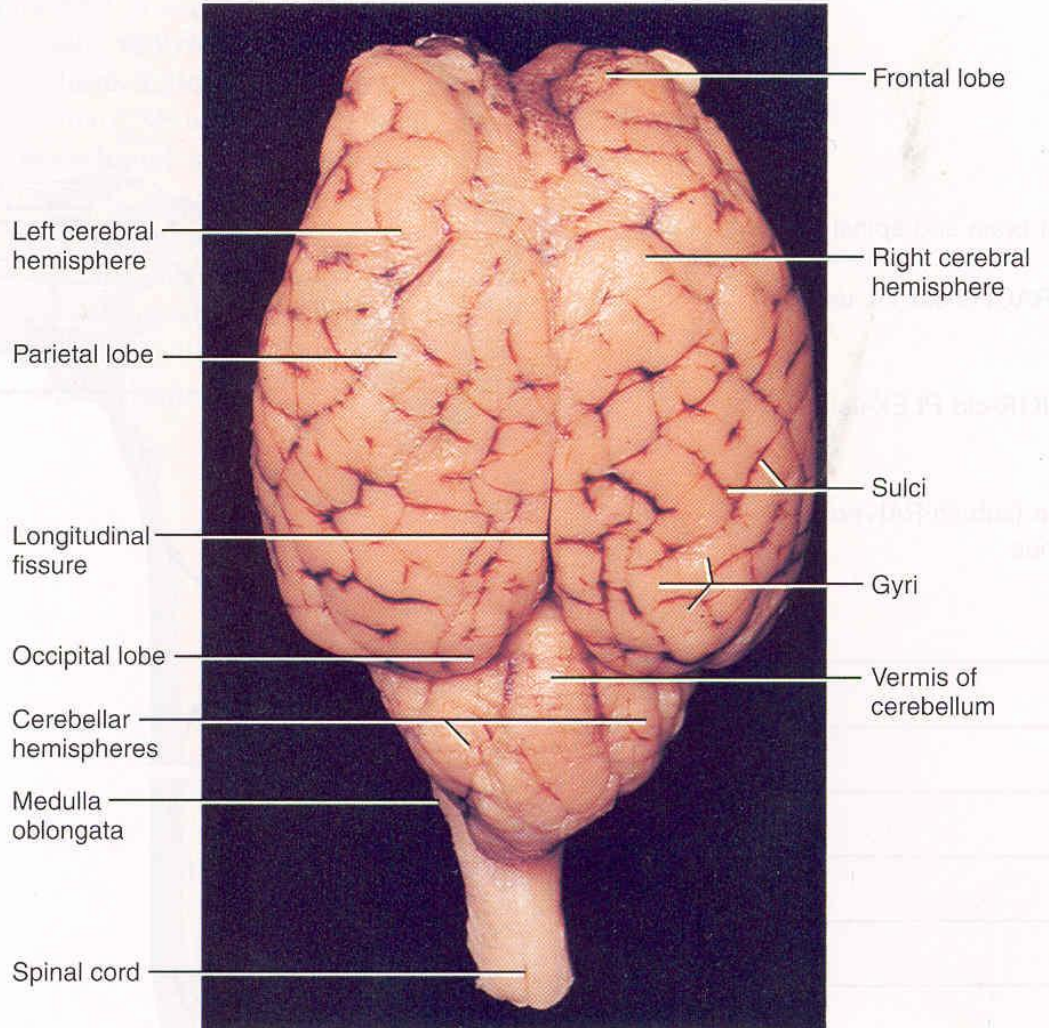
Question 6

- Compare the general size and the various areas of the sheep brain (cerebrum, brain stem, cerebellum) to the human brain (right picture). How are they the same and how are they different?



Identify Dorsal Structures

- With the dorsal side up, identify if yours is a right or left cerebral hemisphere, gyri, sulci, and the longitudinal fissure.



Call Mrs. C. over for your first check (#7)
(if she is busy, move ahead until she is ready)

- You will have to point out:
 - If it is a left or right hemisphere
 - A gyrus
 - A sulcus
 - The longitudinal fissure

EACH PERSON MUST POINT OUT FEATURES EQUALLY.

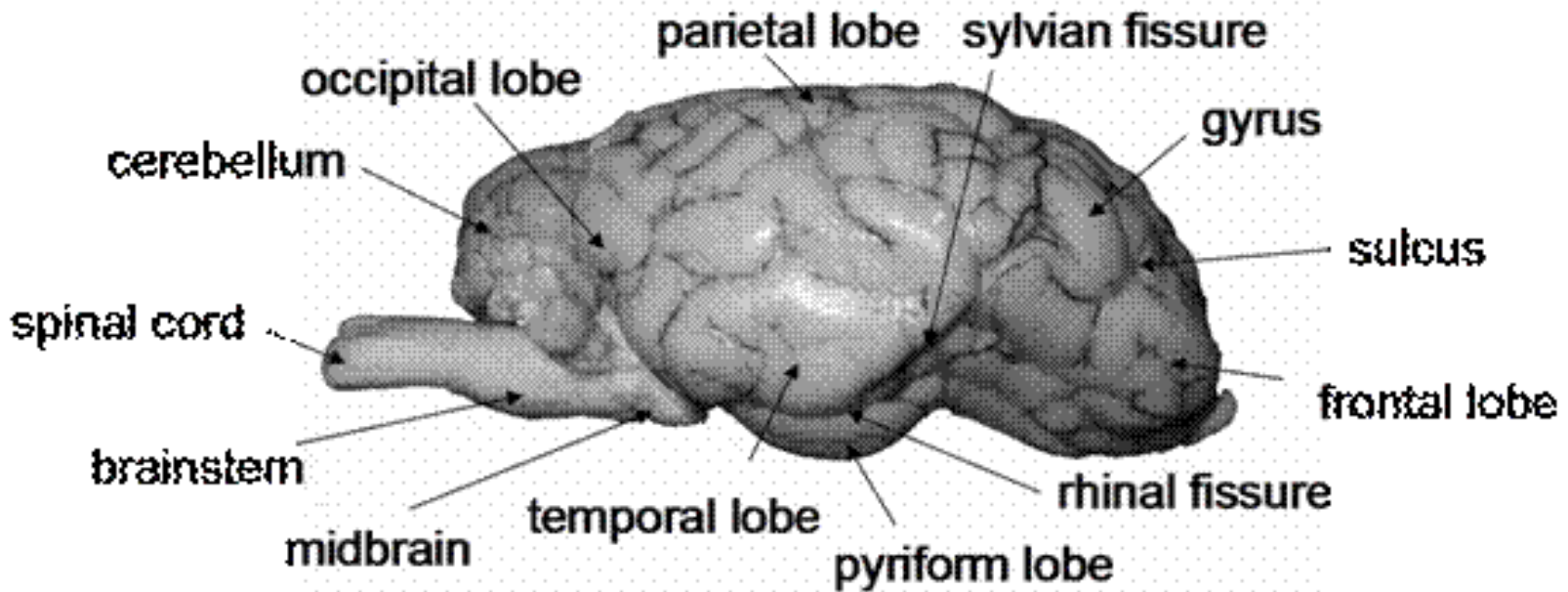
Questions 8-9

8. What does the longitudinal fissure divide?
9. What is the difference between gyri and sulci?



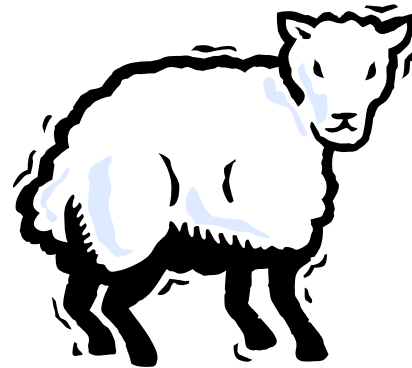
Lobes of the Cerebrum

- Find the 4 lobes of the brain:
 - frontal, parietal, occipital, temporal



Question 10

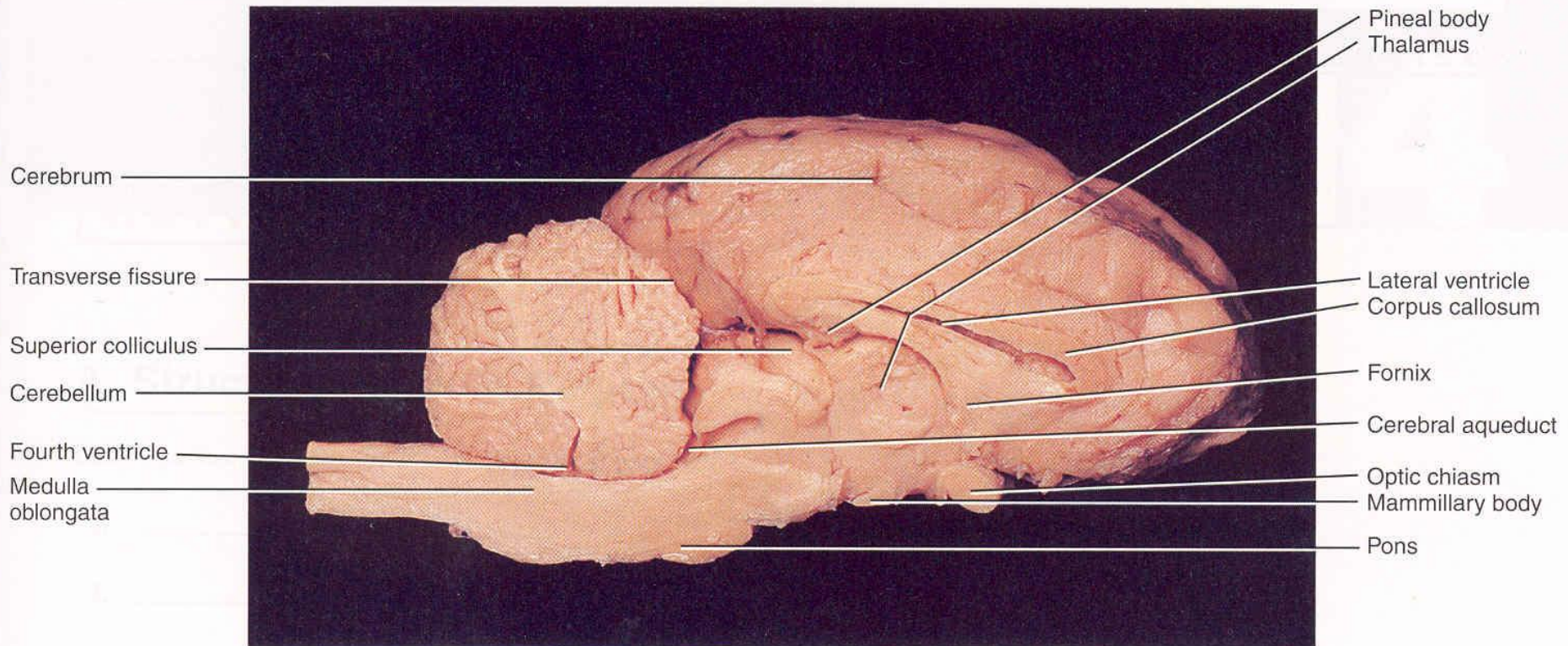
- Name each lobe that functions in
 - a) Hearing
 - b) Vision
 - c) Touch
 - d) Movement



This sheep appears to be shaking. It must think that its brain is next.

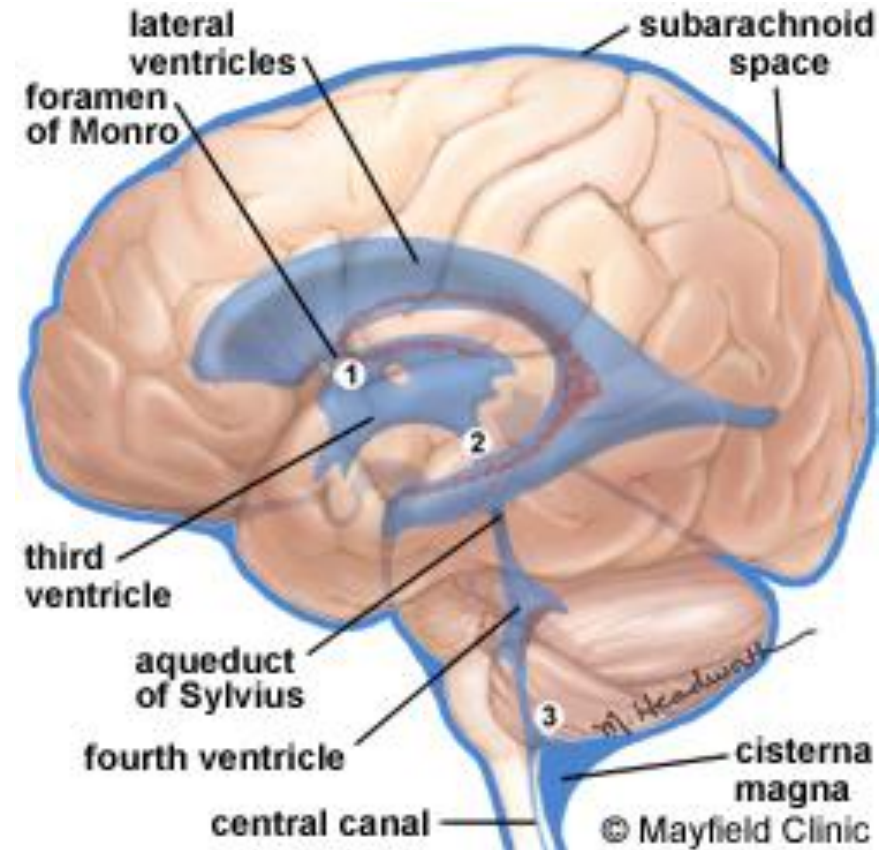
Midsagittal Section

- Locate the **corpus callosum** (thick band of white fibers), **thalamus**, **lateral ventricle**, **fourth ventricle** and **cerebral aqueduct**



Note on Ventricles

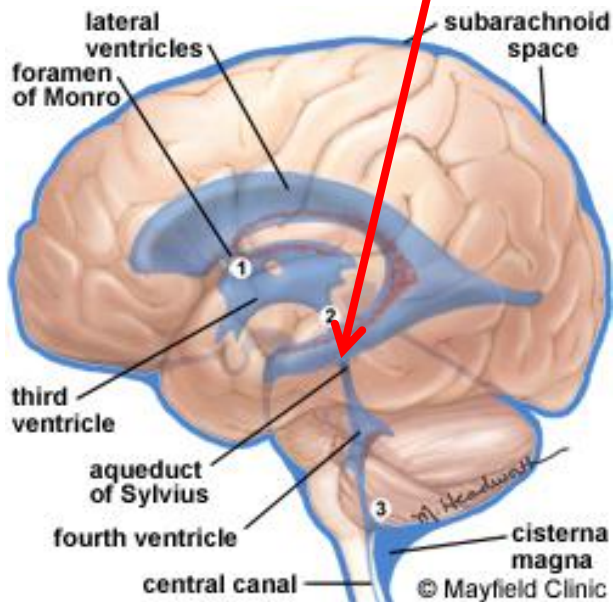
- You cannot see the ventricles well because they are spaces filled with CSF. The picture to the right shows the location of the ventricles of the human brain.



Questions 11 and 12

11. What is the **function** of the ventricles?

12. The cerebral aqueduct allows for the circulation of the cerebrospinal fluid through the ventricles. What would happen if the duct became blocked/how would that **affect brain tissue**?

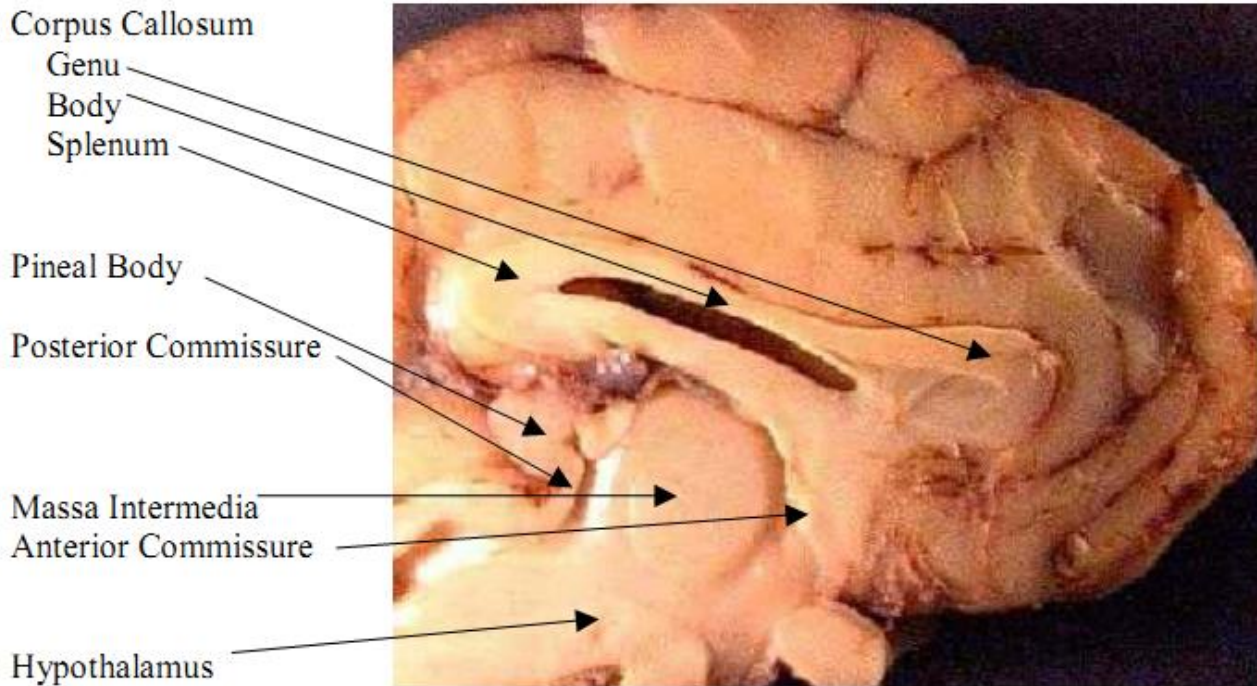


More food. Now. Or we will keep giving you the evil glare.



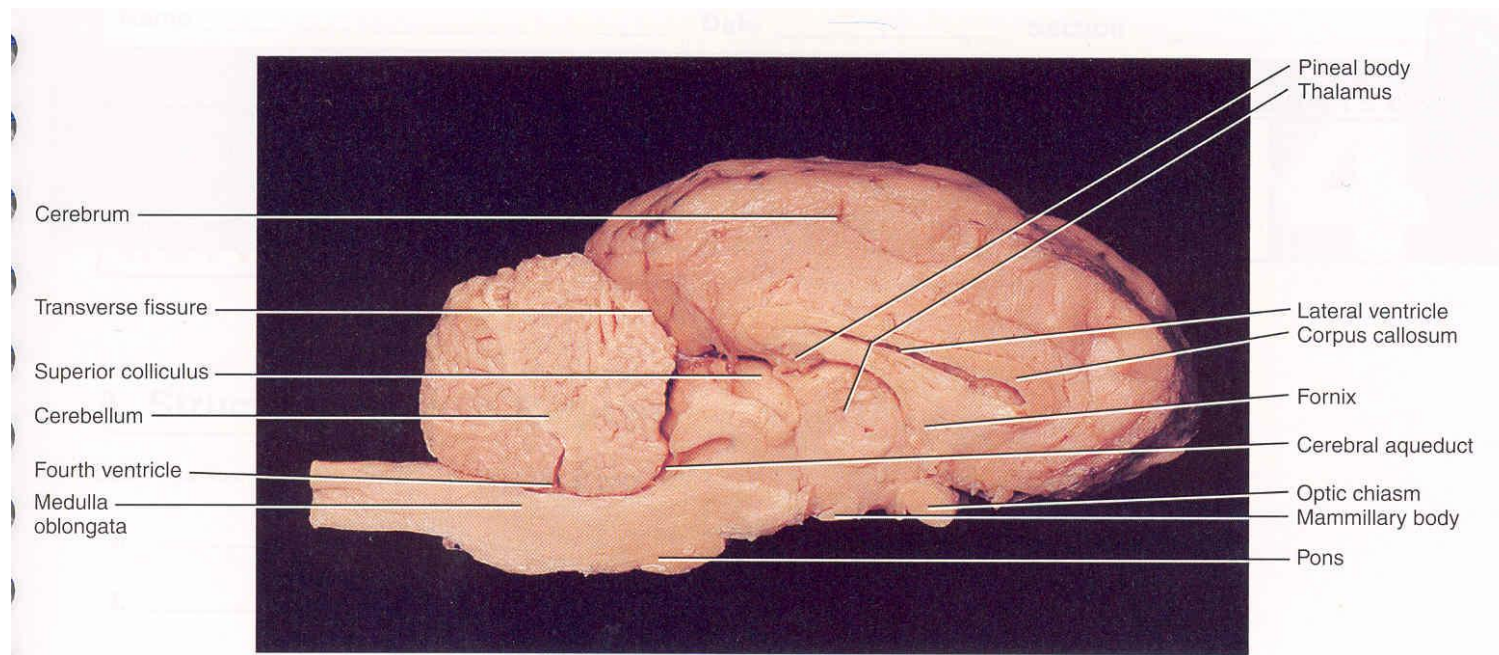
Corpus Callosum

- QUESTION 13: Besides holding the two hemispheres together, what is its function?



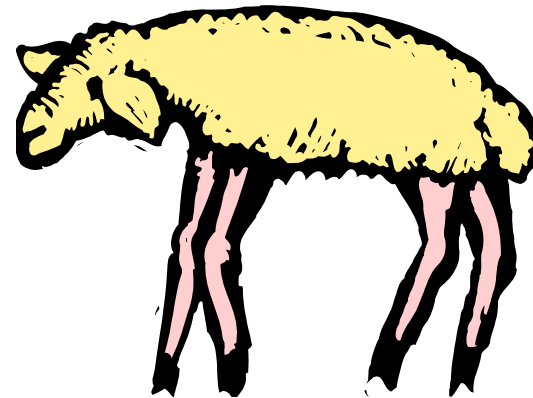
Brainstem

- Locate the three parts of the brainstem- the **midbrain, pons** and **medulla oblongata**.



Question 14

- Could you survive without the Medulla Oblongata and Pons? Explain.



Why does this sheep have really weird legs? That's creepy.

15) Call Mrs. C. over for your next check.

(if she is busy, move ahead until she is ready)

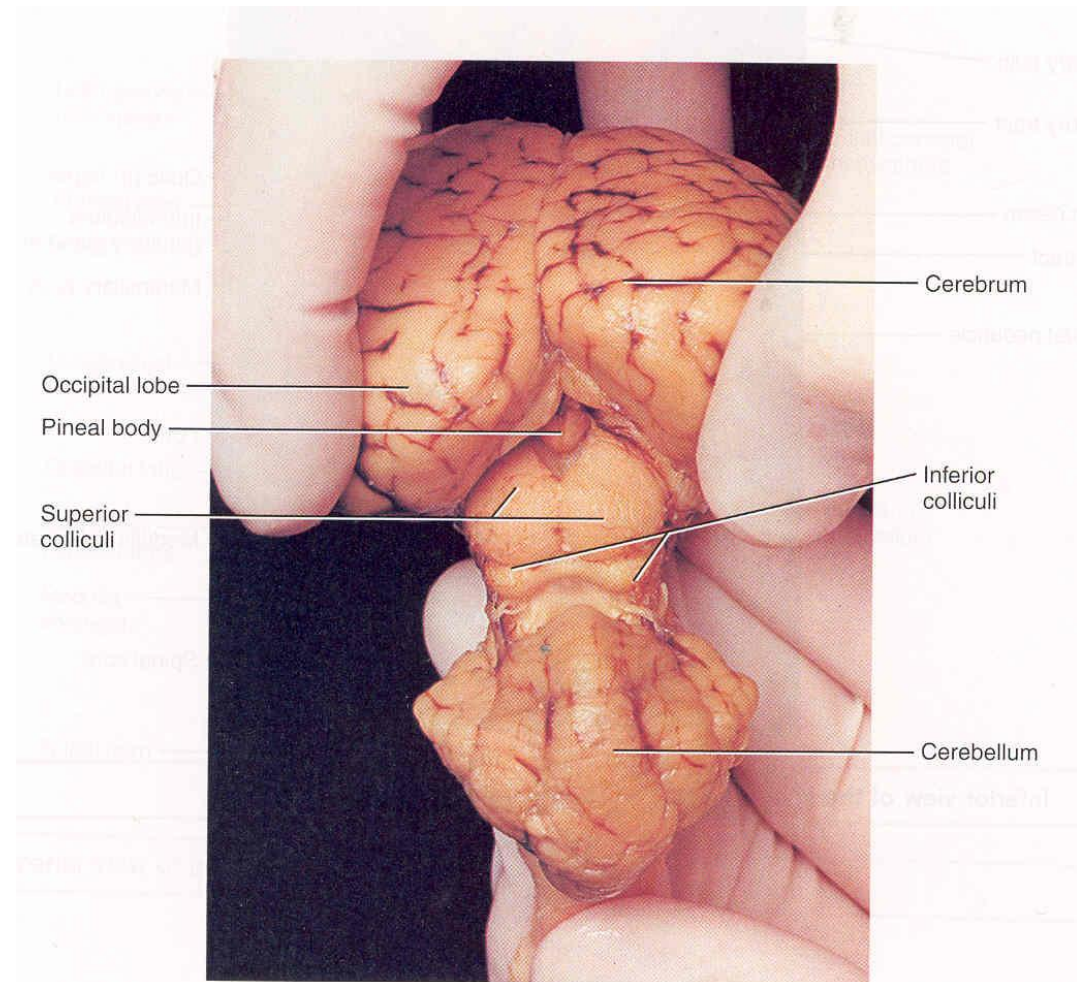
- You will need to point out
 - Cerebrum
 - Cerebellum
 - Corpus callosum
 - Brainstem

**EACH PERSON MUST POINT OUT
FEATURES EQUALLY.**

After this check, you can put the brain away. However, you still need this powerpoint to answer the last few questions.

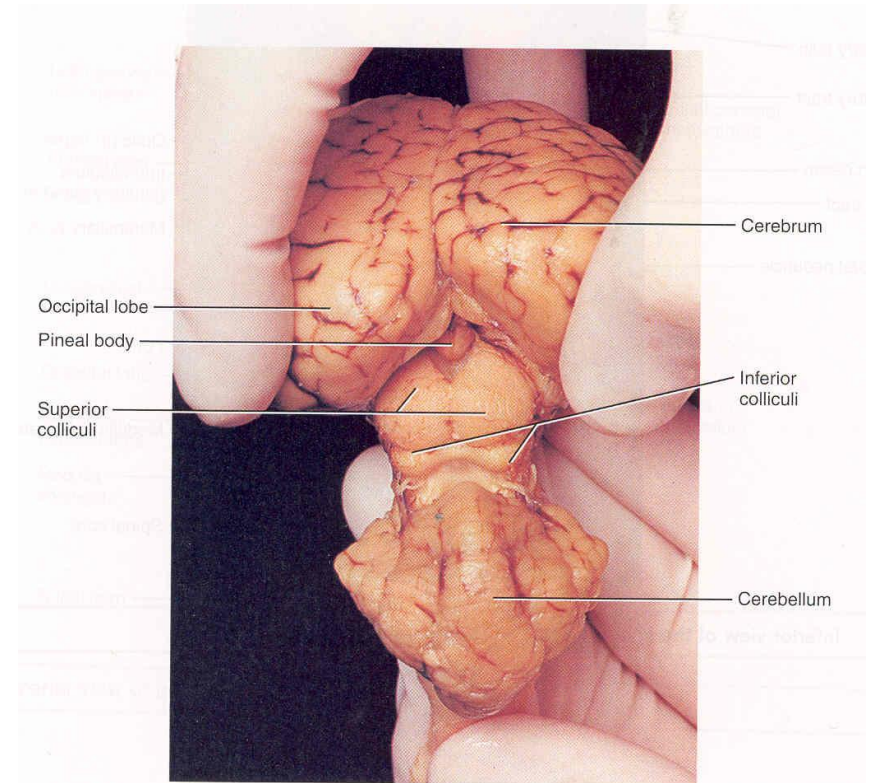
Identify dorsal structures- use the picture below since you only have one half.

- Identify the **pineal gland (body)**. It produces the hormone melatonin at night, which is the sleep hormone.



Functions- Pineal Gland

- **Pineal gland-**
Produces the hormone melatonin at night, which is the sleep hormone.



Question 16 Reading

According to nlm.nih.gov, melatonin's main job in the body is to regulate night and day cycles or sleep-wake cycles. Darkness causes the body to produce more melatonin, which signals the body to prepare for sleep. Light decreases melatonin production and signals the body to prepare for being awake.

Some people who have trouble sleeping have low levels of melatonin. It is thought that adding melatonin from supplements might help them sleep. Use this information to answer question 16 on the next slide.

Question 16

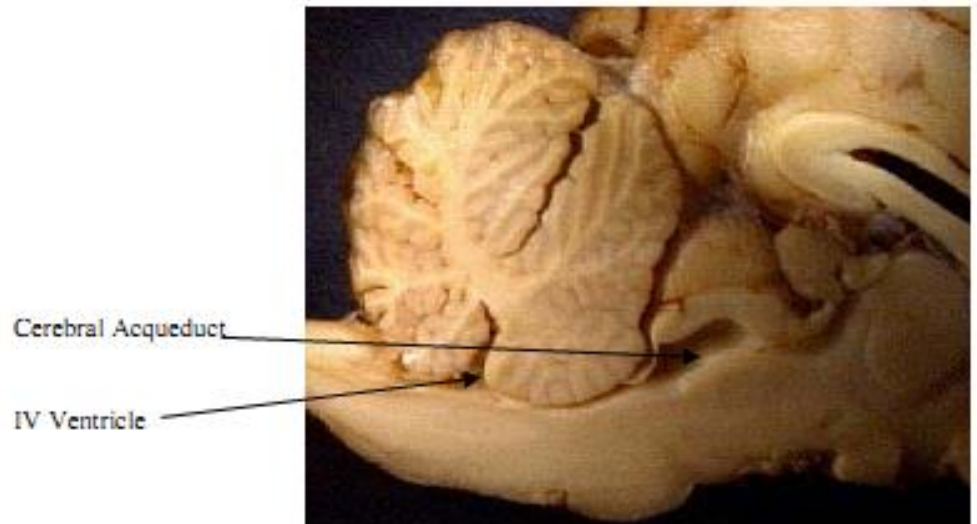
- If you have trouble sleeping, why do doctors suggest not being on your computer, a cell phone, or in areas with bright light for about an hour before you go to bed?



“I feel sick...fences don't sit very well in the stomach.”

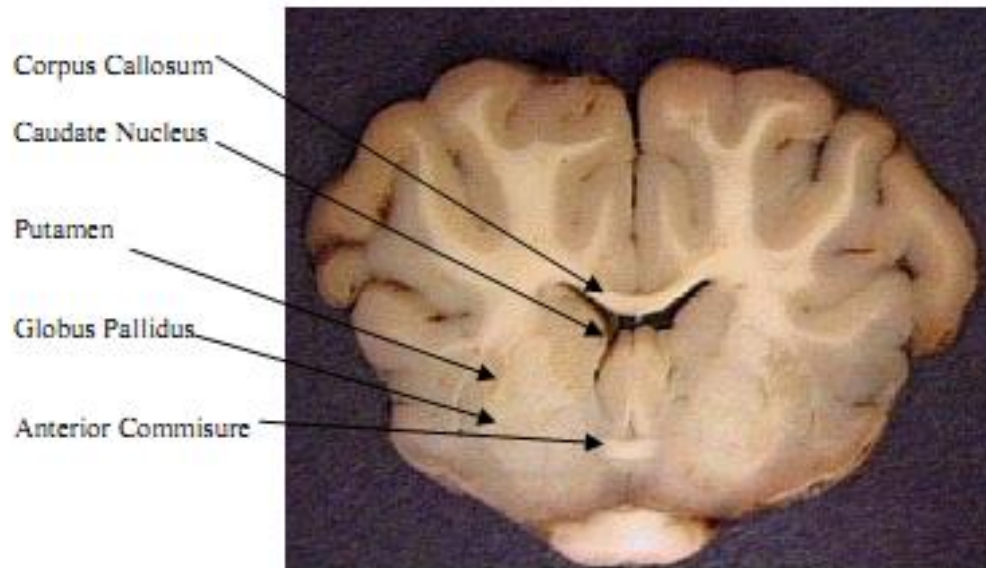
Cerebellum

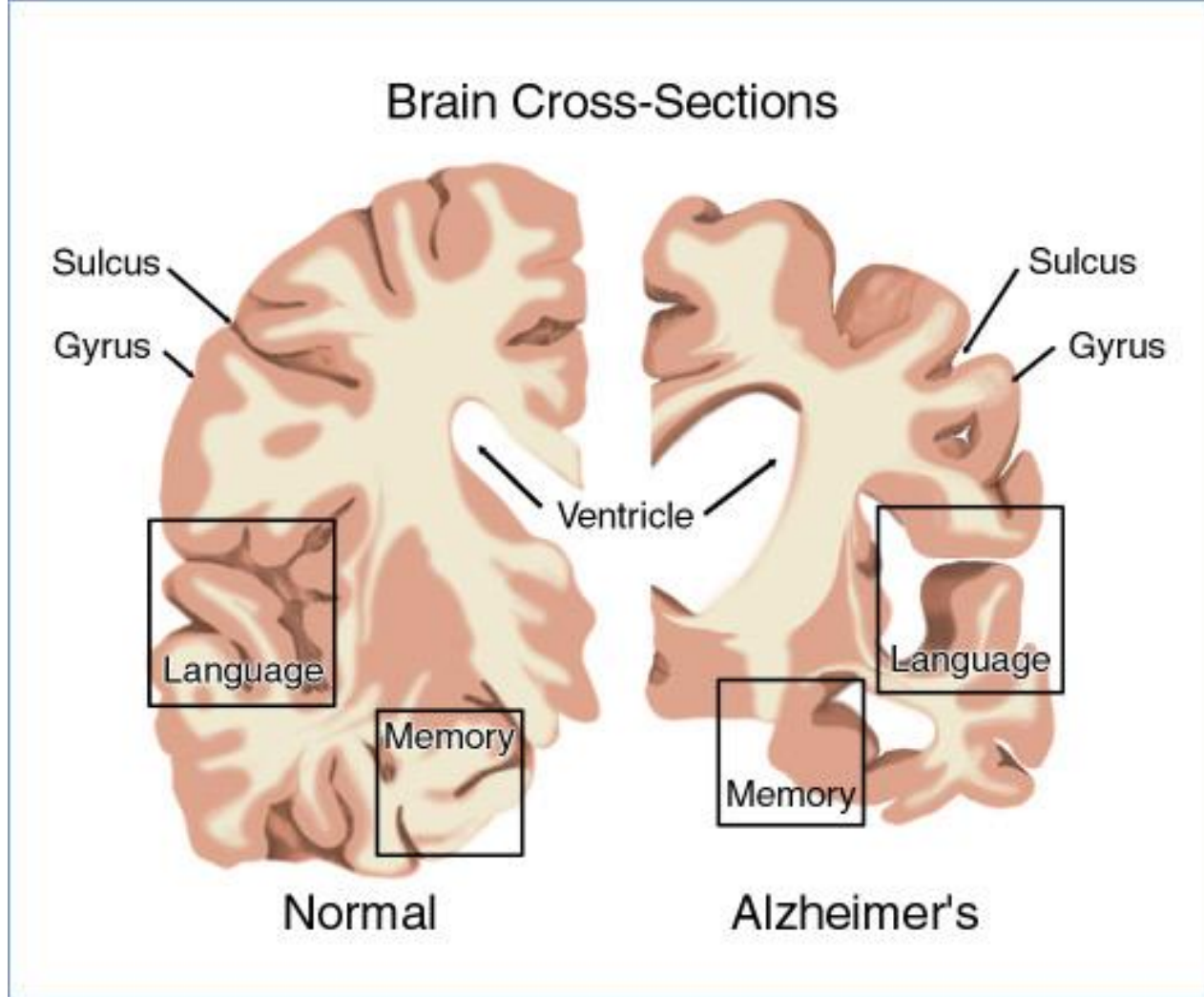
- Look at the cerebellum. Notice the pattern of **white matter** (collection of axons) and **gray matter** (collection of nerve cell bodies). The resulting patterns is called the **arbor vitae** (living tree).
- Question 17- why is it called the arbor vitae? Consider its appearance.



Brain Cross Section

- View the cross sections of the brain below—note the gray and white matter.





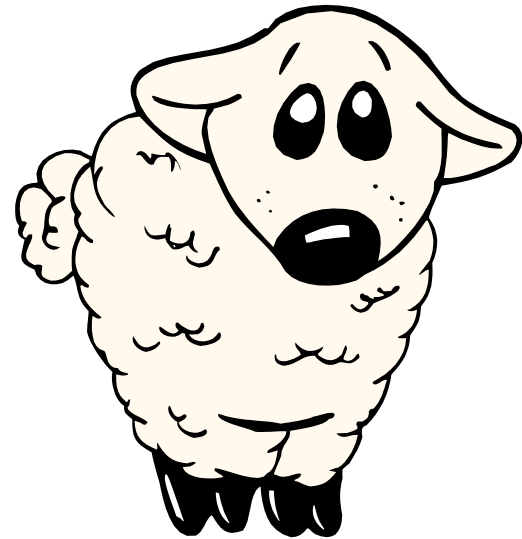
QUESTIONS 18 AND 19: Use the picture above.

18. How does the amount of tissue in a normal brain compare with the Alzheimer's brain?

19. Why does Alzheimer's cause memory loss?

The End!!

- Carefully place the brain back in the bucket (10 per bucket)
- Rinse off your tray and set it upside-down over the sink to dry
- Put away other materials
- Wipe down table
- Finish lab/turn in when done



With legs positioned like that, I have no idea how this sheep walks.