

Biology 12
Brain Dissection

*This sheet must be handed in by the end of class.
Every individual hands in their own lab.*

Name: _____

Partners: _____

Purpose:

- To demonstrate safe and correct dissection technique and the correct use of a dissection microscope.
- To understand the structure of the brain including the medulla oblongata, cerebrum, thalamus, cerebellum, hypothalamus, pituitary gland, corpus callosum, and meninges and relate it to their functions.
- To use the dissecting microscope to compare the structure (including grey/white matter) of the cerebrum and cerebellum.

Introduction: Sheep brains, although much smaller than human brains, have similar features and can be a valuable addition to anatomy studies. See for yourself what the cerebrum, cerebellum, spinal cord, gray and white matter, and other parts of the brain look like!

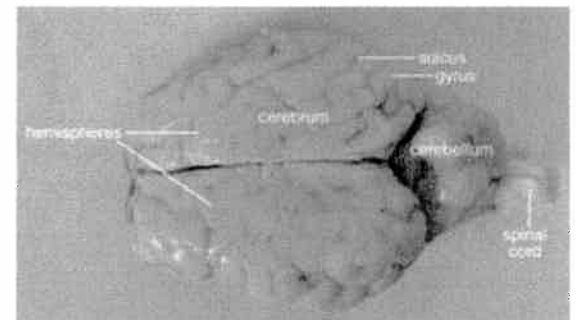
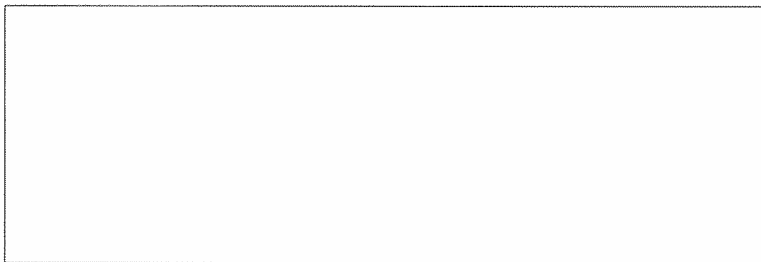
Material (per group):

- Dissection tray, scissors, probes, scalpel
- Dissecting Microscope
- Plastic Gloves and apron
- Sheep Brain
- Coloured pins

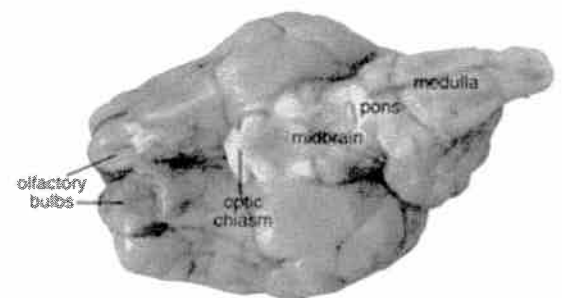
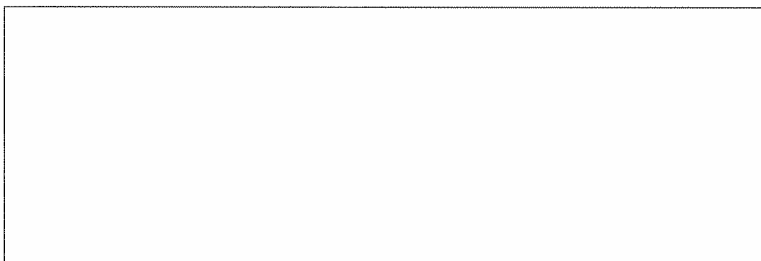
Procedure:

Observation: External Anatomy

1. You'll need a preserved sheep brain for the dissection. Set the brain down so the flatter side, with the white **spinal cord** at one end, rests on the dissection pan. Notice that the brain has two halves, or **hemispheres**. Can you tell the difference between the **cerebrum** and the **cerebellum**? Do the ridges (called **gyri**) and grooves (called **sulci**) in the tissue look different? How does the surface feel?



2. Turn the brain over. Identify the medulla oblongata. The shape of the medulla oblongata is more curved in humans. Why do you think this is?

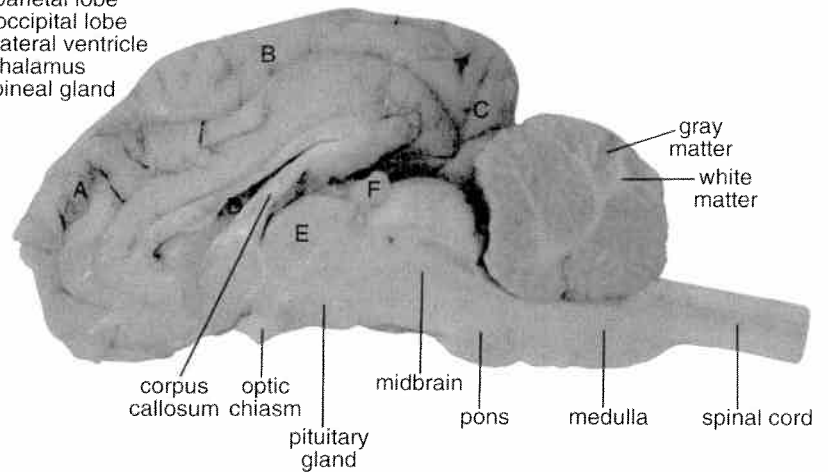


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Dissection: Internal Anatomy

1. Place the brain with the curved top side of the cerebrum facing up. Use a scalpel (or sharp, thin knife) to slice through the brain along the center line, starting at the cerebrum and going down through the cerebellum, medulla oblongata, and spinal cord. Separate the two halves of the brain and lay them with the inside facing up. Be careful not to cut off the pituitary gland!

- A. frontal lobe
- B. parietal lobe
- C. occipital lobe
- D. lateral ventricle
- E. thalamus
- F. pineal gland



2. Use the labeled picture to identify the corpus callosum, medulla, pons, midbrain, and the place where pituitary gland attaches to the brain. (In many preserved specimens the pituitary gland is no longer present. It is not pictured.) Use the dull probe to gently probe the structures and see how they are connected to each other. What does that opening inside the corpus callosum lead to? How many different kinds of tissue can you see and feel?

3. Look closely at the inside of the cerebellum. You should see a branching "tree" of lighter tissue surrounded by darker tissue. The branches are **white matter**, which is made up of nerve axons. The darker tissue is **gray matter**, which is a collection of nerve cell bodies. You can see gray and white matter in the cerebrum, too, if you cut into a portion of it.

4. Label the following parts of the brain with the coloured pins:

Structure	Colour
Medulla oblongata	<i>blue</i>
Cerebrum	<i>black</i>
Thalamus	<i>yellow</i>
Cerebellum	<i>white</i>
Hypothalamus	<i>red</i>
Pituitary gland	<i>green</i>
Corpus callosum	<i>clear</i>
Meninges	<i>#1</i>

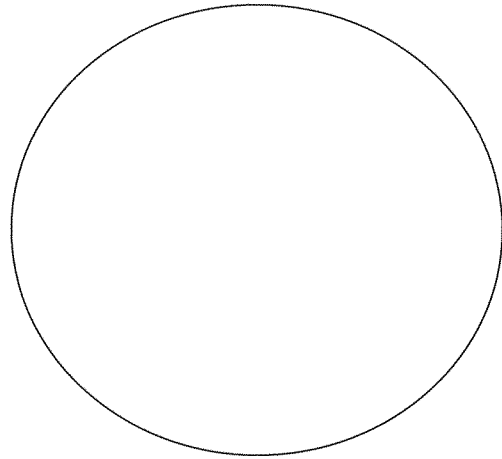
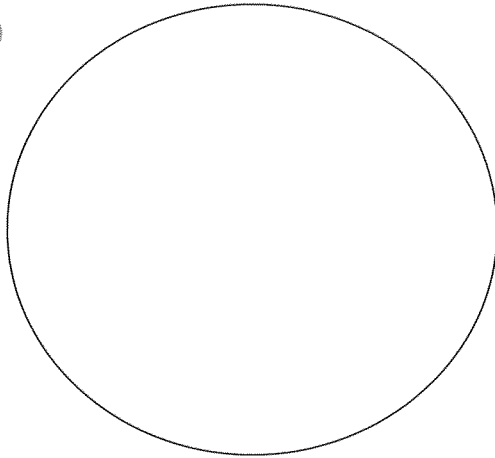
4. Slice off a very thin section of the cerebrum, place it under the dissecting microscope (in a dissecting dish). Sketch in the space on the next page. Follow the same procedure with a section of the cerebellum. Label your sketches!

Cerebrum

Magnification: _____

Cerebellum

Magnification: _____



Discussion Questions

- 1) Compare and contrast the differences between the microscopic structure of the cerebrum and the cerebellum.
- 2) What is the difference between the grey matter and the white matter?
- 3) What might be expected to be the primary signs of damage to the cerebellum?
- 4) What ensures a high surface area of the cerebrum? Why is this important?
- 5) State any conclusions, questions, insights or ideas that you gained from this dissection:

Performance Based Assessment

	Beginning	Developing	Accomplished	Exemplary
Dissection - Labeling	Many structures are incorrectly labeled or not labeled at all	The majority (more than half) of structures accurately labeled	Almost all structures accurately labeled	All structures accurately labeled
Medulla oblongata, cerebrum, thalamus, cerebellum, hypothalamus, pituitary gland, corpus callosum, and meninges				
Diagrams	-Magnification is not correctly identified -White and grey matter are not labeled - Diagram is not realistic	-Magnification is identified but not correct -White and grey matter are incorrectly labeled - Diagram is not neat	-Magnification is correctly identified, but the diagrams are at different magnifications -White and grey matter are correctly labeled in one drawing but not the other - Diagram is neat and realistic, but not drawn in pencil	-Magnification is correctly identified and both diagrams are at the same magnification -White and grey matter are correctly labeled - Diagram is neat and realistic and drawn in pencil
Observation and Discussion Questions	Does not demonstrate a basic understanding of concepts.	Demonstrated the recognition of basic concept knowledge . Is able to recall basic ideas of concepts.	Demonstrates solid understanding and application of concept to new situations.	Demonstrates complete and in depth understanding of concepts through analyzing, synthesizing, and evaluating .