EduExplora
Session 1 Syllabus

Neuroscience: exploring the brain and behavior

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Course Overview: This is an introductory course about the structure and function of the nervous system. We will examine and discuss brain anatomy, brain cells, communication in the brain, the various sensory systems, motor systems and a few "higher" brain functions such as sleep, learning and memory. We will discuss how the brain manages to coordinate all these functions, as well as examine examples of what happens when the brain "fails" at its job (diseases, addiction, etc). To achieve this goals, we will also examine brains from different species and perform a sheep brain dissection. Additionally, we will explore how scientists learn about the brain and the biological basis of behavior, focusing on the tools that past and current neuroscientists use to figure out how the brain works. Please don't hesitate to ask questions; scientific progress is only possible when we work together to ask and answer questions!

Topics:

1. Introduction to neuroscience
2. Evolutionary brains lesson
    a. Including observing brains of 8 different animal species and testing hypotheses about brain evolution
    b. Connection to model organisms and biomedical research
3. Brain anatomy and sheep brain dissection lesson
    a. Including examining external and internal sheep brain anatomy
    b. Connecting brain structure to function and dysfunction in the "great sheep brain mystery" activity discussion

Learning Objectives:

1. After the introduction and the evolutionary brains lesson, students will be able to:
    a. Record quantitative and qualitative observations on brain structures and relative sizes.
    b. Construct a cladogram, given a group of animals or a sample of different brains.
    c. Understand what major features distinguish brains of different species, and observe these features in a variety of brains.
    d. Articulate hypotheses about how the brain has evolved over time.
    e. Discuss how brain features and model organisms permit biomedical research into human health and disease.
2. After the brain anatomy and sheep brain dissection lesson, students will be able to:
    a. Discuss similarities and differences between human and sheep brains.
    b. Identify major regions of the brain and explain their functions.
    c. Record qualitative observations of brain structures and observe these structures in real sheep brains.
    d. Hypothesize about how damage to specific regions of the brain can affect performance of specific tasks.