



LESSON 3: INVESTIGATING THE BRAIN



Level: Key Stage 4

Duration: 60 minutes

Resources: Investigating the brain presentation
Areas of the brain diagram
Investigation techniques information sheets
Investigation techniques table



View/download film &
other resources

Overview: This lesson introduces students to the human brain and what makes it such a challenging and fascinating area of study. They work in teams to research and report on different techniques including electrical stimulation, brain imaging and animal studies. Students evaluate the strengths and weaknesses of each method.

LEARNING OBJECTIVES

Identify some areas of the brain, and describe their function

Explain some of the difficulties of investigating brain function and treating brain damage/disease

Working scientifically: evaluate the benefits and risks of procedures carried out in the brain and nervous system

STARTER

Reveal the quotes on slide 1 of the 'Investigating the brain' presentation one-by-one and have students guess what word goes in the blanks.

Use slide 3 to show and describe the function of the cerebral cortex, hypothalamus, pituitary gland, medulla and cerebellum. Give students an *Areas of the brain diagram* for them to label and note the function.

Take suggestions as to why it is difficult to understand the brain. Discuss the fact that the brain is a complex and delicate structure which makes investigating and treating brain disorders very challenging.

MAIN

1. Show *The Future of Science* film which explores transcranial magnetic stimulation (TMS) and how it can be combined with brain imaging.

Follow-up discussion prompts:

- Was there anything in this film which surprised you?
- What are some of the problems with using animal experiments?
- How does TMS overcome these problems?

2. Display instructions on slide 6 of the '*Investigating the brain*' presentation.

Ask students to get into groups of four and label each member of their group A, B, C and D. You can then divide the classroom into four sections (A, B, C and D) and have students move to their section.

Each section will research a different procedure used to investigate the brain:

- A: Animal experiments
- B: Studying patients with brain damage
- C: Electrical stimulation
- D: Brain imaging

They will gather information from the relevant *Investigation techniques information sheet* and write notes in the *Investigation techniques table*.

Students return to their original team of four and report the information they learned for others to write in their tables. Everyone should have a completed table by the end.

Extension: through discussion and debate with their group, students can evaluate each procedure and decide which they believe to be the most effective and important to medicine.

PLENARY

Show slide 11 of the '*Investigating the brain*' presentation and ask students to decide which procedure would be most useful to answer the three questions.

Show slide 12 of the '*Investigating the brain*' presentation for think, pair, share follow-up discussion:

- If you had £10 billion to find out more about the brain, how would you invest the money?
- Explain why you would invest in some procedures, but not others. (Prompt them to discuss animal experiments and whether they feel this is a good area on which to spend time and money.)

