Stage 3 Science / STEM Session outline (grades 4 & 5)

Time: 60 minutes

Number of students actively involved: 8

Extra time for whole class involvement available at extra cost (up to 25 students).

1. Introduction: What's in our head? Brain health

2. Short video with stoppages to explain concepts. Treading on a Lego block used to explain signal travel via neurons. **Brain health discussed** and brain waves introduced.

3. Demo of the power of one neuron (3 x students)

4. Demonstration of one type of 'brain reader' using one student and an exercise in producing 'Theta' waves. 1 x student

5. An introduction to the next type of brain reader and explanation of the concept. 1 x student

- Look at the **use of this in medicine/science. Disability aids.**

- They move objects on screen with their mind
- Full colour moving image of their brain shown
- Zoom in on neurons

6. Another student to do the same yet with the addition of a thought-controlled game 1 x student

7. Another student to play the game 1 x student

Selection of a 2nd student to play in a best of 3 thought contest. 1 x student

8. Round-up of the session**, other future uses** and quick quiz.

Stage 4/5 Science / STEM Session outline (grades 7-10)

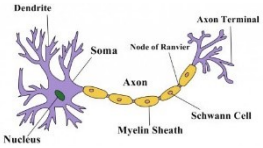
Time: 60 - 75 minutes

Number of students actively involved: 8

1. Introduction: What's in our head? Neurons introduced

2. Short video to explain concepts. Treading on a Lego block used to explain pain response and flight or fight. Brain waves introduced.

- **Brain health**
- Alcohol & drug effects
- Sport concussion rules



- Overview of Action Potentials and how the electric signal is boosted via axons

3. Demo of one neuron power (3 x students)

4. Demonstration of MindWave EEG using one student producing 'Theta' waves. 1 x student

5. The Emotiv 14 sensor. **In medicine: Mind movement of prosthetics/wheelchairs.** 1 x student

- Moving objects on screen with their mind
- Full colour moving image of their neurons shown to group.
- Zoom in on individual neurons / axons

6. Another student with addition of a thought-controlled game 1 x student

7. Another student to play the game 1 x student

Selection of a 2nd student to play in a best of 3 thought contest. 1 x student

8. **Careers in STEM. Future EEG use.** Round-up of the session and explanation of Socrative quiz.

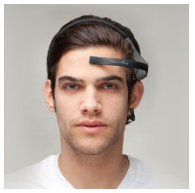
Stage 6 Investigating Science / Biology (2018 +)

Time: 75 - 90 minutes

Number of students actively involved: 10

1. Introduction: What's in our head? Neurons introduced

2. Short video to explain concepts. The pain response and flight or fight. Brain waves introduced.



- Overview of brain health
- Alcohol and drug effects
- Concussion rules in sport
- **In depth: Action Potentials**, dendrites and axons

3. Demo of one neuron power (3 x students)

4. Demo of MindWave EEG to show 'Theta' waves. **Theta & their importance explained.** 1 x student

5. **A short experiment looking at how Theta waves can be increased. Importance to HSC. 2 x students**

6. Introduction to the Emotiv 14 sensor and explanation of the concept. 1 x student

- Moving objects on screen with their mind
- Full colour moving image of their neurons shown to group. Axons identified
- Zoom in on individual neurons

7. Selection of a student to do same with the addition of a thought-controlled game 1 x student

8. Selection of a 2nd student to play in a best of 3 thought contest. 1 x student

9. Careers in Science. Round-up of the session and explanation of Socrative quiz.