

Mindz Brainplay

Fun Neuroscience
DET provider number 0100392629



Costs for schools & syllabus links NSW (as at May 1, 2019)

Recommended session times per group (depending on school timetables):

Years 7-10: 60-75-minute session | **Years 11-12:** 60-90-minute session | **Years 11-12: Investigating Science / Working Scientifically / Infectious & Non-Infectious Disease:** 90-120 minutes + set-up time (see below).

Format:

Small or large group presentation depending on school needs. Mindz can present to a small group (<8) where every student will get a 'turn' or to larger group where several students show what is possible.

For all groups we need to connect to a large screen or data projector. For large areas, a sound system is needed.

For years 7-12 (stages 4, 5 and 6), we've found that groups of students are happy to watch 8-10 'demonstrators' show what is possible using the EEG headsets. A 60-90-minute session is usually fine.

Costs

We operate on a flat fee basis and try to fit in with school needs. For regional schools (150 – 250km from Sydney CBD) we do full day bookings only.

Single standard session (60-90 mins): Small/large group format: \$310 + gst

Investigating Science/Working Scientifically Research sessions (90-120 mins + set-up): \$480 + gst

Half-day (3 hours): We can present two standard sessions: \$480 + gst

Full-day (6+ hours): We can present four standard sessions, two investigating Science/Working Scientifically research sessions or a mix: \$790 + gst

Extra 'Mind Control' session: Where students who didn't get to demonstrate in our main session get to use the EEG to see their brain activity and use mind control. Allow 10 students per 30 minutes. Added to single session or half day bookings only. 30 minutes \$100, 60 minutes \$180 + gst, 90 minutes \$250 + gst

Mindz post-visit activity packs: We always give teachers a page of definitions and follow-up activities. However, we can also provide basic EEG headsets with matching experiments at extra cost. Please discuss this with us before our visit.

Contact us at schools@mindz.net.au

Stage and Outcome points NSW

<p>Stage 3 Outcomes: <i>Science incorp. Tech.</i></p> <p>ST3-1VA: Shows interest and enthusiasm ST3-3VA: Informed attitudes on future use of tech ST3-6PW: Scientific understanding of electricity transfer</p>	<p>Stage 4 Outcomes: <i>Working Scientifically</i></p> <p>SC4-1VA: Appreciates science SC4-2VA: Finding solutions SC4-8WS: Creates plausible solutions SC4-11PW: Scientific Knowledge – energy transfer SC4-15LW: Biological evidence</p>	<p>Stage 5 Outcomes: <i>Working scientifically</i></p> <p>SC5-1VA: Appreciates importance of science SC5-11PW: Scientific knowledge – energy transfer SC5-14LW: Interactions between components in biological systems (SC5-14LW)</p>	<p>Stage 6 Outcomes <i>Investigating Science / Working Scientifically</i></p> <p>BIO 11/12-1, BIO 11/12-3, BIO12-5, BIO 11/12-6BIO12-7, INS 11/12-2, INS 11/12-3. INS 11/12-5, INS 11/12-6, INS 11/12-7</p> <p><i>This Working Scientifically research session differs from the Investigating Science session in that students need to DESIGN their investigation using supplied stimuli.</i></p>
	<p>Stages 4 and 5 Outcomes <i>Life skills</i></p> <p>SCLS-1VA: Recognises role of science SCLS-2VA: Working scientifically increases understanding SCLS-19LW: Science and tech has improved human health</p>		<p>Stage 6 Outcomes <i>Biology - infectious/non infectious from term 4, 2018</i></p> <p>BIO 12-14: Analyses infectious disease in terms of cause, transmission, m’ment and organism’s response, BIO 12-15: Explains non-infectious disease and disorders and a range of technologies and methods used to assist, control, prevent and treat.</p>
<p>Stage 6 Outcomes <i>Investigating Science – Fact or Fallacy</i></p> <p>INS 11/12-1: Develops and evaluates questions and hypotheses for scientific investigation INS 11/12-3: Conducts investigations to collect valid/reliable primary and secondary data & info. INS 11/12-5: Analyses and evaluates primary and secondary data and information INS 11/12-7: Communicates scientific understanding with suitable language for a specific audience INS 11-8: Identifies that the collection of primary and secondary data initiates scientific investigations INS 11-9: Examines the use of inferences and generalisations in scientific investigations INS 12-12: Develops and evaluates the process of undertaking scientific investigations INS 12-13: Describes and explains how science drives the development of technologies INS 12-14: Uses evidence-based analysis in a scientific investigation to support or refute a hypothesis</p>			

Stage 4 & 5 Science / STEM Session outline

(grades 7-10 Science and Technology)

Time: 60 - 75 minutes **Group size:** Unlimited yet <30 preferred **Number of students actively involved:** 10

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 and neuron communication
- Alcohol & drug effects
- Sport concussion rules

3. Demonstration of MindWave EEG producing 'Theta' waves. 3 x students

4. The Emotiv 14 sensor. How it was developed and the story of **Tan Le**.

- Mind movement of image and the relevance to disability sector: 1 x student
- Full colour moving image of neurons shown: 2 x students
- Students do battle in game using their mind to control the characters: 4 students

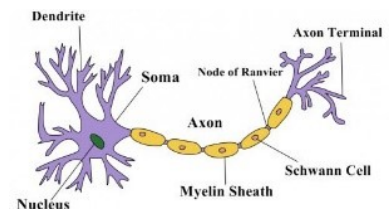
5. **Flying a drone** using thought control.

6. Round-up of the session and explanation of Socrative quiz if chosen by teacher.

Time: 60-75 minutes

Group size: 10+

Number of students using EEGs: 10



Stage 6 Biology

Infectious / non-infectious diseases of the brain

Time: 90 minutes

Number of students actively involved: 10

Group size: Unlimited yet <30 preferred

1. Introduction: What's in our head?
2. Short video to explain concepts. The pain response and flight or fight. Brain waves introduced.

- Overview of brain health
- Alcohol and drug effects - foetal alcohol syndrome

■ **In depth: Infectious and non-infectious diseases that impact the brain. Causes, symptoms and current treatment. Brain EEG demonstration.**

→ **Infectious** → Toxoplasmosis → Meningitis

→ **Non-Infectious** → Parkinson's → Epilepsy → Deep brain implants

3. Demo of MindWave EEG for 'Theta' waves. **Theta & their importance in exams explained.**

3 x students

- 4 **Explanation of how Theta waves can be increased. Importance to HSC.**

5. Introduction to the Emotiv 14 sensor and explanation of the concept Story of Tan Le.

- movement of image and the relevance to disability sector: 1 x student
- Full colour moving image of neurons shown: 2 x students
- Students do battle in game using their mind to control the characters: 4 students

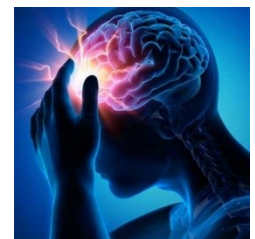
6. **Flying a drone** with mind control.

7. **Careers in Science.** Round-up of the session and explanation of Socrative quiz if chosen by teacher.

Time: 75-90 minutes

Group size: 10+

Number of students using EEGs: 10



Stage 6 Working Scientifically

Session Type: Research – Scientific Method

Number of students actively involved: Up to 20 (4 x groups)

Time: 90 -120 minutes + 70 minutes set-up: Total time half day

Space needed: large area where up to 4 x groups of 5 students can work without distraction

Equipment required: 1 x laptop per group. We can provide 2 laptops for group use if needed.

What we provide: 1 x EEG per group, data recording sheets, 2 x laptops

Summary content: A 90-minute exploration using EEG headsets to work scientifically. The session is based around group work, not lecture and presentation. Students will **design** an investigation using provided equipment and stimuli. They will **collect, analyse and evaluate** their data following consistent criteria and using scientific method including controls. They will then communicate this to a specific audience.

Time: 90-120 minutes

Group size: Maximum 20

Number of students using EEGs: 20

Our set-up time: 70 minutes

Total: Half a day: Cost \$480 + gst

Stage 6 Investigating Science

Session Type: Research – Fact or Fallacy

Number of students actively involved: Up to 20 (4 x groups)

Time: 90-120 + 70 minutes set-up: Total time half day

Space needed: large area where up to 4 x groups of 5 students can work without distraction

Equipment required: Data projector or large monitor, 1 x laptop per group.

What we provide: We provide EEG headsets, 2 x laptops, software, A3 answer sheets, & Socratic questions with results sent to the teacher.

Time: 90-120 minutes

Group size: Maximum 20

Number of students using EEGs: 20

Our set-up time: 70 minutes

Total: Half a day: Cost \$480 + gst

What happens during a session?

1. **Introduction.** A brief 10-minute overview of the workings of the brain including the role of neurons and the different brainwaves created from levels of neuronal activity. (8 minutes)
2. **Technology.** EEG headset explained demonstrated with one student. Group divided into '**Research groups**' of 3 - 5 students. Their investigation task and terms explained. (12 minutes)
3. **Reference/Control Task:** Taking measurements of a **particular brainwave** from group in controlled manner. This involves observers, timekeepers, recorders and subjects where all students are involved. The results of this form a '**control**' for the group. (15 minutes)
4. **Fact or Fallacy.** Group then repeats the task outlined in **3** but with certain stimuli added **that represent commonly held beliefs about brainwaves.** The results are recorded for each student. (35-40 minutes). We provide the stimuli. Some examples include:
 5. → That a physically horizontal position increases Theta waves.
 6. → That heavy metal music decreases Theta waves and increases Gamma waves.
7. **Results / conclusion:** Students discuss the results with reference to **fact or fallacy.** They then make a conclusion about their research
8. **Science and Society.** Students create a 3-sentence summary of how the findings, technology or both can be used to make a difference in society. (*INDIVIDUAL SOCRATIVE 5-minutes*).

