

Learning Intentions	Lesson Outcomes
<ul style="list-style-type: none"> <li>Students explore how the brain’s network can learn using old memories.</li> <li>Students investigate how the brain functions when humans learn new things and repeat those tasks</li> <li>Students investigate neuroplasticity</li> <li>Students reflect on and discuss their brain region design and present their ideas to the class</li> </ul>	<ul style="list-style-type: none"> <li>Understand the concept of Meta learning and how it applies to real world examples of research in this field.</li> <li>Understanding how we learn and how our brain’s network is designed to constantly learn new things.</li> <li>Learn how the structure of our brain’s network – graph features – are important for effective learning.</li> <li>Work collaboratively to complete the design of a brain region and present it to the class.</li> </ul>
Australian Curriculum Content Descriptors	Australian Curriculum General Capabilities
<p><b>Health and Physical Education</b></p> <ul style="list-style-type: none"> <li>Personal, social and community health: Evaluate situations and propose appropriate emotional responses and then reflect on outcomes of different responses (<a href="#">ACPPS094</a>)</li> </ul> <p><b>Visual Arts</b></p> <ul style="list-style-type: none"> <li>Understanding how visual arts works: Develop and refine techniques and processes to represent ideas and subject matter (<a href="#">ACAVAM127</a>)</li> <li>Understanding how visual arts works: Manipulate materials, techniques, technologies and processes to develop and represent their own artistic intentions (<a href="#">ACAVAM126 - Scootle</a>)</li> </ul> <p><b>Design Technologies</b></p> <ul style="list-style-type: none"> <li>Develop, modify and communicate design ideas by applying design thinking, creativity, innovation, and enterprise skills of increasing sophistication (<a href="#">ACTDEP049</a>)</li> </ul> <p><b>Science Inquiry Skills</b></p> <ul style="list-style-type: none"> <li>Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations (<a href="#">AC SIS174 - Scootle</a>)</li> </ul>	<p><b>Critical and Creative Thinking –</b></p> <ul style="list-style-type: none"> <li>Identify and clarify information and ideas</li> <li>Seek solutions and put ideas into action</li> <li>Apply logic and reasoning</li> <li>Evaluate procedures and outcomes</li> <li>Reflect on processes</li> <li>Organise and process information</li> </ul> <p><b>Personal and social capability –</b></p> <ul style="list-style-type: none"> <li>Make decisions</li> <li>Develop reflective practices</li> <li>Work independently and show initiative</li> <li>Recognise emotions</li> <li>Understand themselves as learners</li> <li>Become confident, resilient and adaptable</li> </ul> <p><b>Literacy –</b></p> <ul style="list-style-type: none"> <li>Understand learning area vocabulary</li> <li>Understand how visual elements create meaning</li> </ul>

## Assessment

### Formative Assessment

- Students are introduced to the concept of Meta Learning. They will complete Data Collection Sheet 4 to show how our brain's Executive Functions change in relation to what's happening in our environment.
- Students will use small group collaboration to design an entity/machine that represents their chosen brain region. This design will be extended on adding a new component to represent the lessons topic.

## Equipment List

- Brain PowerPoint Lesson 3
- Data Collection Sheet 4
- Stationery, coloured pencils and pens
- Blank A4 paper for group drawings and designs
- Student Handouts collected at the end of Lesson 1:
  - Data Collection Sheet 1
  - Data Collection Sheet 2
  - 7 Regions of the Brain
  - Machine designs started in Lesson 1 & 2

Phase/Slide	Learning Activity	Resources
Slide 1 - 3 Engage	<ul style="list-style-type: none"> <li>• Greetings/Introduction</li> <li>• Acknowledgement of Traditional Custodians</li> <li>• Lesson Aims/Attributes</li> </ul>	PowerPoint
Slide 4	<ul style="list-style-type: none"> <li>• Warm up Game (optional)</li> </ul>	PowerPoint
Slide 5 Reflect	<ul style="list-style-type: none"> <li>• Recap from Brain Lesson 2</li> <li>• Explain that today we will learn about Meta Learning</li> </ul>	PowerPoint
Slide 6 Explore	<ul style="list-style-type: none"> <li>• Describe what Meta Learning is</li> <li>• Explain how a scenario of getting lost on a hike will be used to demonstrate how our brain network can help us learn and navigate our way out</li> </ul>	PowerPoint
Slide 7 – 14 Create	<ul style="list-style-type: none"> <li>• Describe, step by step, what happens in our brain as we learn about and respond to a new environment.</li> <li>• Ask students to draw the network onto their brain handout at each step</li> </ul>	PowerPoint Data Collection Sheet 4

Phase/Slide	Learning Activity	Resources
Slide 15 - 17 Reflect	<ul style="list-style-type: none"> <li>Recap what we learnt in Graph theory and explain how the brain needs long and short connections, and how we can strengthen these through learning – known as neuroplasticity</li> <li>View video outlining published research investigating brain networks of memory athletes and how, when provided with memory training, the control group's networks underwent neuroplasticity</li> <li>Explain Meta learning using a graph depicting effort and learning performance</li> </ul>	PowerPoint and video
Slide 18 - 21 Create	<ul style="list-style-type: none"> <li>Describe, step by step, how our brain network operates under stress.</li> <li>Ask students to draw/make notes on their brain handout at each step</li> </ul>	PowerPoint Data Collection Sheet 4
Slide 22 Explore	<ul style="list-style-type: none"> <li>Describe a real-world study that used graph theory to investigate brain networks of participants with Social Anxiety disorder</li> </ul>	PowerPoint
Slide 23 – 24 Collaborate	<ul style="list-style-type: none"> <li>Ask students to work in groups formed last session to build on the design of their group's brain region</li> <li>Using new knowledge from lesson 2 students add to their designs something to assist in easier or more efficient communication</li> <li>Ask groups to share their designs with the class</li> </ul>	PowerPoint Handouts collected at end of lesson 2
Slide 25 - 28 Reflect	<ul style="list-style-type: none"> <li>Ask students to write down 3 things they learnt in today's session.</li> <li>Discuss what was learnt.</li> <li>Any questions</li> <li>Ask students to complete survey</li> </ul>	PowerPoint Data collection sheet 2