

# Neuroplasticity 3 - Headlines

## Learning Intention

Students will understand the concept of neuroplasticity. They will learn what happens to their brain when challenged.

## Australian Curriculum Link

Science: Biology

Critical and creative thinking capability: Reflecting on thinking and processes

## Basic facts

When learning something new, the neurons in the brain fire and wire to create new neural pathways. The first time a connection forms is the most difficult. It is during struggle and challenge that new neural pathways form.

See below for examples of neuroplasticity.

## Vocabulary

Please refer to the ThinkPlus Journey Glossary for definitions of the following vocabulary;

- Neural pathways
- Synapse
- Neuron
- Dendrite
- Axon terminal
- Neurotransmitter
- Neuroplasticity

## Preparation

- Print [Neuroplasticity 3 Headlines Activity](#)- one between two students
- Print **Headline Templates** - There are 8 different headline templates (two on each page).
- Make paper structures from light card (cover paper). You will find the instructions here: [Impossible Paper Puzzle Trick](#). I fold the base so that the structure stands up.

## ThinkPlus Resources

Neuroplasticity 3 – Headlines PPT  
Headline templates  
Neuroplasticity 3 Headlines Activity



## Equipment

- One paper structure per table of 6
- 4-5 pieces of A6 light card (cover paper)
- Scissors – pair per student
- Pen/pencil per student
- Felt tips pens for each group

## Outline

This module follows the **Neuroplasticity 3 Headlines PowerPoint**. Detailed teacher notes accompany each slide.

- Students attempt Impossible Paper Puzzle.
- Watch video about neuroplasticity.
- Share examples of the power of neuroplasticity
- Watch video about echolocation.
- Small group activity: List 3 thoughts about the power of neuroplasticity.
- Create headlines about thoughts.

## Reflection

What did I learn from today?

How could this new understanding help me next time I face a new learning challenge?

## Ideas

Students use Neuroplasticity Headlines to create a display for a public space within the school.

## Examples of Neuroplasticity

### London Cabbies

London cabbies study for two to four years to become qualified. During this time, they must memorize an incredible 25,000 streets and 20,000 landmarks. They then sit an extremely hard test called The Knowledge. Would-be Cabbies take the test an average of 12 times before passing. Scientist measured the part of the brain associated with memory- the hippocampus- before and after the training. They found that, in these cabbies, this part of the brain had grown significantly. They had created many new pathways, learning and remembering The Knowledge.

### Girl with Half a Brain

When she was 3, Cameron Mott suddenly started having seizures. For the next three years, the Motts took Cameron to dozens of doctors who conducted hundreds of examinations in an effort to discover what was causing 10 or more such seizures a day. All the while, Cameron's cognitive functions were deteriorating and she was losing the ability to speak. Finally diagnosing Rasmussen's syndrome, doctors removed the right side of Cameron's brain. Since the left side of the body is controlled by the right side of the brain, doctors knew that Cameron would be paralysed on her left side when she awoke. But they also knew that the brains of children have amazing abilities to rewire themselves. Cameron was immobilized for the first two days after the surgery to allow her brain to stabilize. Then she went into an intensive physical therapy program. Four weeks after the surgery, she walked out of the hospital. The left side of her brain had rewired itself to do the jobs of the now removed right hemisphere of Cameron's brain.

### Concert Violinist

This young teenage concert violinist suffered a stroke and could no longer play violin. However, intensive therapy rewired her brain to use different undamaged parts of the brain to do the work of the parts of the brain damaged by the stroke. She was back performing within two years of the stroke.

Doctors now know it is very important for stroke victims to do intense therapy with the paralysed side of the body rather than focussing in strengthening the undamaged side. The brain rewires itself in response, creating new pathways to replace those damaged by the stroke.

### Braille

Scientists have found that the part of the brain associated with touch- the sensorimotor cortex, is larger in the brains of those who can read Braille.

### Echolocation

Human echolocation is the ability of humans to detect objects in their environment by sensing echoes from those objects, by actively creating sounds – for example, by tapping their canes, lightly stomping their foot, snapping their fingers, or making clicking noises with their mouths. People trained to orient by echolocation can interpret the sound waves reflected by nearby objects, accurately identifying their location and size.