

MATH SITE: AU MATH CENTRE

Some Words of Encouragement for the Intrepid

If you have ever experienced a sickening fear of having to take a course in mathematics or an overwhelming feeling of helplessness when studying it or even sheer mind-numbing panic on a math exam, then read on. First of all, we are here to tell you that you are not alone. Many have had the same kinds of experiences when faced with the study of this, to some fascinating, to most challenging, to others terrifying and even hated, subject. However, you should also be made aware of how your uncontrolled emotions and feelings may be affecting your own innate abilities to learn it.

There is now a growing body of neuroscience research which indicates that “Complex learning is enhanced by challenge and inhibited by threat associated with helplessness” (from the [Brain/Mind Learning Principles](#) wheel of Renate and Geoffrey Caine).

QUOTE: “**Complex learning is enhanced by challenge and inhibited by threat associated with helplessness and/or fatigue.**”

- **Research on neural plasticity** shows that the brain is extraordinarily malleable and that many areas of the cortex are literally shaped by experience.

If one thinks of Mathematics as another “language,” then research on the relationship between neural plasticity and the learning of a second language may be found at:

(Li, P., Legault, J., and Litcofsky, K. (2014). Neuroplasticity as a function of second language learning: Anatomical changes in the human brain. *Cortex*, 58, pp.301-324.
<https://www.sciencedirect.com/science/article/pii/S0010945214001543>)

(Voss, P., Thomas, M., Cisneros-Franco, J., and de Villers-Sidani, É. (2017). Dynamic Brains and the Changing Rules of Neuroplasticity: Implications for Learning and Recovery. *Frontiers in Psychology*, 8. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5649212>)

- **Research on the vast degree of interconnectedness between different regions of the brain**, and on the nature of neural networks, indicates that academic learning and comprehension is never separate from emotions, meaning, motivation, past experience, recognition and memory.

(Fuster, J.M. (2022). Cognitive Networks (*Cognits*) Process and Maintain Working Memory. *Frontiers in Neural Circuits*.
<https://www.frontiersin.org/articles/10.3389/fncir.2021.790691/full>).

- **Research on emotions and the brain** documents that some types of comprehending are inhibited by fear and helplessness.

(Tyng, C. M., Amin, H.U., Saad, M.N., Malik, A.S. (2017). The Influences of Emotion on Learning and Memory. *Frontiers in Psychology*.
<https://www.frontiersin.org/articles/10.3389/fpsyg.2017.01454/full>).

QUOTE: “ **Emotion has a substantial influence on the cognitive processes in humans, including perception, attention, learning, memory, reasoning, and problem solving.** “

The AU Math Centre is intended to give you a safe place to learn where there is no shame in not knowing and where your mistakes will not cost you anything but another opportunity to correct them. It is a place where, if you persist in visiting often and regularly, over time you should slowly begin to experience greater confidence and less helplessness in understanding some of myriad aspects of this rather interesting subject which has applications or import in almost all human endeavour and walks of life.

Here:

1. You may either read or listen to explanations: some motivational, some detailed or top-down summaries, and still other applications of the theory;
2. You may work through an exercise or assignment having similar question types, but not the same questions, as many times as you wish until you get the desired grade or comprehension you think is acceptable;
3. You may test and re-test yourself for memory and understanding.

However, before you embark on this course towards self-confidence and success, take a look at the presentation: ***Mathematics of Life***¹. It will show you one way to achieve 100% in math learning contexts.

So... if you are the type of person who thinks of Life as one big party, check out [Mathematics of Life for partygoers](#). On the other hand, if you are the kind who sees Life as a journey, embark on [Mathematics of Life for seafarers](#).

1. This presentation was originally an open source document on the Web. It has been modified somewhat to suit the context.

The inclusion of ‘*With no apologies at all to:.....*’ is a piece of impertinence built into the template of the presentation which could not be deleted. If you don’t like it, we don’t apologize.