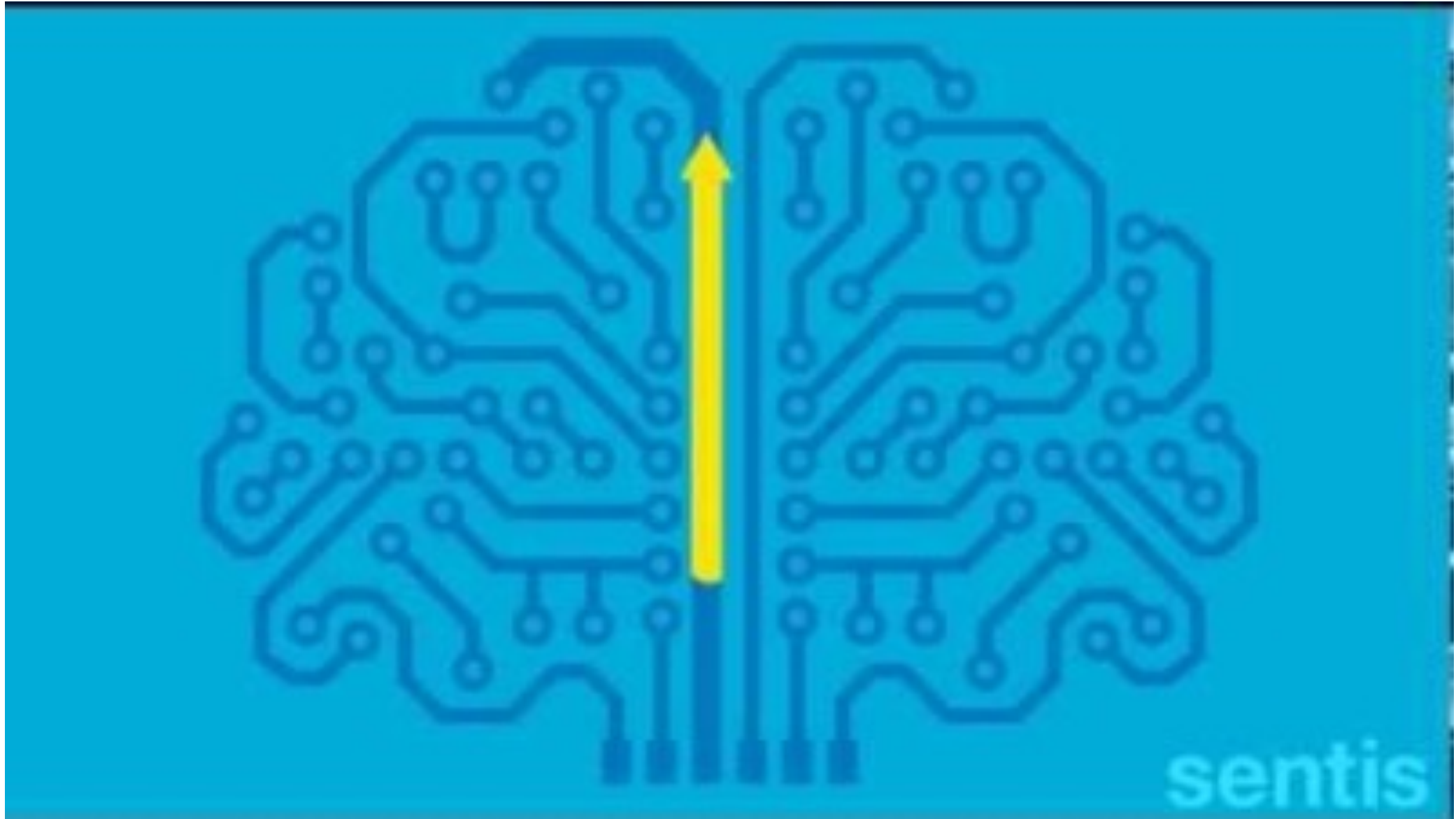




**Discussion Topic:
17-18th May
Neuroplasticity**

Definitions

- A wide range of definitions exist in relation to the term neuroplasticity,
 - **'The ability of the brain to change in structure or function in response to experience'**
 - **'The capacity of the nervous system for adaptation or regeneration after trauma'**
 - **'The ability of the Central Nervous System to undergo structural and functional change in response to new experiences'.**



10 PRINCIPLES THAT DRIVE NEUROPLASTICITY

What is Neuroplasticity?

The brain's ability to change, adapt, and regenerate following a neural injury such as after a stroke or a traumatic brain injury.

AGE MATTERS

Younger brains adapt and change more easily

TRANSFERENCE

If you practice something in a nearby area of the brain, it will transfer to other areas of the brain

REPETITION

You have to practice a lot of times to see neural changes

SPECIFICITY

Plasticity is experience specific to the individual

INTENSITY

Need the right amount of physical activity to cause brain changes

SALIENCE

Has to be motivating and important to that person

TIME MATTERS

Waiting too late to start the activity means a decreased capability to change

INTERFERENCE

Sometimes new plasticity can be delayed

USE IT OR LOSE IT

Neural circuits not actively engaged will start to atrophy or degrade

USE IT AND IMPROVE IT

Table 2: Core principles of experience-dependent neuroplasticity

1. Use it or lose it	Neural networks not actively engaged in training can degrade
2. Use it & improve it	Training can induce dendritic growth and synaptogenesis within specific brain regions that enhance task performance
3. Specificity	The nature of training dictates the nature of the plasticity
4. Repetition matters	Repetition is required to induce lasting neural change (skill instantiation)
5. Intensity matters	A sufficient intensity of stimulation is required to induce plasticity
6. Time matters	Different forms of plasticity occur at different times during training
7. Salience matters	The training experience must be sufficiently rewarding to induce plasticity
8. Age matters	Training-induced plasticity occurs more readily in the younger brain
9. Transference	Plasticity induced by one training experience can enhance the acquisition of similar behaviours
10. Interference	Plasticity induced by one training experience can interfere with the acquisition of similar behaviours