

## HYDRATION BOOSTS LEARNING

- Structured Mineral Water (referred to as 'water') is essential for optimal **brain health** and function. It **enhances blood circulation** and aids in removing wastes.
- 'Water' is necessary to maintain the tone of membranes for normal **neurotransmission**. One of the most fascinating aspects of neurons is that they store water in tiny balloon-like structures called vacuoles.
- 'Water' keeps the brain from overheating, which can cause **cognitive decline** and even damage.
- **Dehydration** most commonly occurs because children go long periods of time without drinking water. This is one of the main reasons to encourage students to drink water during exercise. By the time thirst is felt, there may be a loss of body weight up to 2% from water loss, and **10% cognitive decline may be present**.
- Dehydration can lead to fatigue, dizziness, **poor concentration** and **reduced cognitive abilities**. **Even mild levels of dehydration can impact school performance**.
- It is interesting to note that hydration has been found to affect exercise tolerance. Students who are dehydrated tend to feel tired during exercise and avoid activity, **a risk factor for obesity**. When students are hydrated well before exercise and drink water during their exercise, they have a more enjoyable experience with **less fatigue**. Furthermore, children have a different response to exercise than adults, and tend **to overheat more quickly**, making good hydration essential.
- **Researchers at the Institute of Psychiatry in London and the MRC Cognition and Brain Sciences Unit in Cambridge**, found that **teenagers' brains work**



**less efficiently** when they become dehydrated, making tasks such as **problem solving far harder**. The researchers carried out brain scans on ten **teenagers** who were asked to perform 90 minutes of exercise to induce moderate dehydration before being given a series of problems solving and reaction time tests. Although the children lost just 1.1 per cent of their body weight through dehydration during the tasks, the study showed that **their brains had to work harder** to carry out the same task when dehydrated.

The children's ability to perform the tasks did not change, but functional **Magnetic Resonance Imaging scans** revealed increased **neural effort** in key parts of their brains such as the middle frontal gyrus and the inferior parietal lobule – key areas in problem solving and learning.

The researchers, whose work are published in the **scientific journal Human Brain Mapping** also warn that **long term dehydration** or more severe dehydration could produce **impairments in cognitive performance** as the brain struggles to compensate due to the dehydration.

- Previous studies have shown that **in adults**, dehydration causes the **brain to shrink in volume**.