

Exercise Your Brain

Module 2 - Akshayuk Pass Expedition



“In addition to priming our state of mind, exercise influences learning directly, at a cellular level, improving the brain’s potential to log in and process new information.”

- Dr John Ratey, Professor of Psychiatry, Harvard Medical School



RUN & LEARN

Ray Zahab likes to run. He likes to run long, long distances. Some think he is crazy, but what they may not fully realize is that running has likely made him a smarter person.

Traditionally the Inuit of Baffin Island also had to travel great distances as they followed the migration of the animals that they ate to remain alive. Like Ray, they also may not have realized that the physical demands of their lives served to keep their brains healthy.

Today most people in Canada and the United States no longer need to exert themselves to find food. Most North Americans can drive a car to a large grocery store and buy what food they require without having to hunt it down, shoot it, grow it or gather it. Hunting and fishing, once essential skills needed to feed the family have for many become recreational activities. Life in North America has become quite sedentary. People can pass much of the day sitting before computers and travelling by motorized vehicles and not engaging in any physical exertion at all. Rates of obesity are higher than ever before. Experts agree this sedentary life is not good for the cardiovascular system and health in general.

But what about the brain? Does our lack of activity affect how our brains work, or conversely, is physical exercise healthy for the human brain?

EXERCISE YOUR BRAIN

When the five i2P youth ambassadors, Kathleen, Amanda, Thomsen, Tamara and Sandi and the rest of the expedition team leave Qikiqtarjuaq and head into the Akshayuk Pass in the next few days, they will be crossing rough terrain and climbing toward the height of the pass at Summit Lake. This will demand significant aerobic effort. Studies are now demonstrating that when they stop for a break and rest for a while, a host of physiologic changes will occur that make their brains much more receptive to concentrate, learn and retain information.

Just ask Allison Cameron a teacher at City Park Collegiate in Saskatoon Saskatchewan. Allison works with students at an inner city school, many of who have academic or behavioral challenges. Struggling with her students in 2006, Allison was looking for a solution when she heard of a school in the United States where exercise was used to promote learning capacity. She read further about the scientific basis of the project in the book ‘Spark’, written by Harvard Psychiatrist Dr. John Ratey.

Video Link:

See How Exercise Revolutionized the City Park School

[Exercise & Learning](#)

Inspired, Allison convinced her school to allow her to place treadmills in her classroom. Starting in September of 2007 she had her students spend 20 minutes of each 40-minute class exercising vigorously on the treadmill and afterwards would teach her lesson. Despite the fact that her teaching time was cut in half she was astonished by the dramatic transformation in her students. The first thing she noticed was an increased concentration on the part of the students. This was followed by dramatic improvements in academic scores and a decrease in disciplinary incidents. Over a four-month period the students in Allison Cameron's class saw increases of between 27% and 36% in their grade level in reading and writing. Similar improvements were witnessed in math. The students themselves, at first very dubious about the program, became complete converts, explaining that with exercise integrated into their classroom they have become better and happier students.

The first school to demonstrate the relationship between vigorous physical exercise and learning ability was a school in Naperville, Illinois, just outside Chicago. Naperville's students follow a rigorous exercise regimen and consistently turn out some of the smartest students in the country. In fact, in 1999, Naperville students competing against 230,000 students from around the world in an international Math and Science test scored sixth in math and first in the world in science.

HOW THE BRAIN RESPONDS TO EXERCISE



Is the Naperville school experience just a coincidence or does vigorous exercise really improve learning capacity? Research is beginning to establish a link between exercise and learning capacity at a molecular level. Exercise is thought to improve learning in three ways:

1. Firstly, endurance exercise appears to increase the brain's capacity to concentrate. After rigorous exercise people are more attentive, and because they can concentrate better they have the ability to process and retain more information.
2. Secondly, exercise causes changes in brain cells and chemistry that promote learning. The brain is composed of a hundred billion cells that interact and communicate using molecules called neurotransmitters. In turn brain cells are managed by a broad range of hormones and growth factors that help them adapt and grow. When people learn, these hormones and growth factors are released and cause new brain pathways to be laid down. These new connections between brain cells serve to 'hard-wire' the memory that becomes the new knowledge just learned. Exercise appears to promote the release of specific neurotransmitters, hormones and growth factors that promote this learning process.
3. The third way in which exercise promotes learning is through a process called neurogenesis. Neurogenesis is the production or growth of brand new brain cells. When people learn, they may require the creation of new brain cells to help form the pathways that become the memory of the new learned

Class Exercise

i2P challenges schools to carry out their own study. Introduce exercise programs into your classrooms and evaluate the impact on academic outcomes. For more information see the video links in this module and reference Dr Ratey's book 'Spark'.

knowledge. Exercise has been shown to promote the growth of new brain cells, or neurogenesis.

RUN FOR YOUR BRAIN

Thus exercise provides people with more brain cells and increases the factors that help those brains cells make connections, and enables people to concentrate better so they can accomplish the work of learning easier. It is remarkable that something as simple as regular exercise can actually make you smarter and can 'strengthen' the brain much like it can strengthen muscles.

Heading into the Akshayuk Pass with the knowledge that exercise can help one learn, nicely frames the stated goals of i2P as its team sets out on its journey; combining the sweat and effort of an endurance expedition with the will to inquire, question and learn about the history, geography and culture of the fabulous land to be traveled.

Video Link:

Dr John Ratey explains the link between exercise and learning.

[Dr. John Ratey](#)



Profile: Dr. John Ratey

Book Reference:

Spark – The Revolutionary New Science of Exercise and the Brain

Dr. John Ratey is a clinical associate professor of psychiatry at Harvard Medical School. He is the Author of eight books, including his most recent work 'Spark'. In the book Dr. Ratey explains how the brain functions better when the body is active and moves regularly. Dr. Ratey touches on fascinating research that demonstrates that regular endurance exercise can have a profound effect on the capacity of an individual to learn, as well as influencing mood, stress and anxiety.