DR JOHN GOODENOUGH WINS THE NOBEL PRIZE IN CHEMISTRY FOR HIS WORK ON THE LITHIUM BATTERY

Dyslexic physicist and chemist John Goodenough ushered in the wireless era with his pioneering work on the lithium battery. He's one of 2019's Nobel Prize winners in Chemistry rightly won because of its impact on technology making mobile devices possible, and nearly all portable electronics, electronic vehicles, medical devices, power tools, and more.

He won the prize not a moment too soon as he is 97 years old. He's still working on the next big thing, a battery that can reduce our dependence on fossil fuels and a way to efficiently store wind and solar energy.

He won the National Medal of Science in 2011 and received it from then President Obama.

John was born in Germany where his father was studying (he eventually became a religion professor at Yale). From an interview in the University of Chicago magazine: "Goodenough struggled with undiagnosed dyslexia (back then, he says, "you were just a 'backward student'"). But he was determined to follow his older brother away to boarding school, so "I taught myself to write so I could write the [entrance] exam."

"I didn't like to read. I couldn't read very well. I'm still not a very good reader. So I wasn't going to do history and I wasn't going to go into law school. "

"I'm just very happy that I got into problems that were interesting to work on and solve."

John still struggled with reading and keeping up with his lessons at Groton, but he enjoyed exploring the animals and plants of the woods around the school, making his own butterfly nets, and found that he could do well with oral languages and mathematics. He received a financial aid package at Yale, but had to work to afford to pay for meals. When an athletic coach told him he could not spend the amount of time he did taking part-time jobs, he had to quit the team.

He was finishing his degree in mathematics when World War II broke out after the attack at Pearl Harbor. After he volunteered for the service, a faculty member told him that the Army needed meteorologists, so soon he was an Army meteorologist heading off to the coast of Portugal. After the war was over, a Yale professor told him about some money for veterans supporting graduate students in physics. He soon found himself at the University of Chicago studying under such luminaries as Edward Teller and Enrico Fermi. After finishing his doctorate, he went to work at MIT which the Air Force had funded to create the US's first air defense system.

INSPIRATION

From **Quartz**: "At the time, computers comprised enough vacuum tubes to fill "the space of a large dance hall," in Goodenough's words, and had infernally slow memories. Not long after Goodenough joined MIT, the team unveiled magnetic-core memory, a much faster, more reliable, and more compact form of storage. In addition to helping enable SAGE, it became the foundation of computer memory systems until semiconductors superseded it in the 1970s. For Goodenough, more advances followed, including the "Goodenough-Kanamori rules," which describe how magnetism works in various materials at the atomic scale—another building block of future computers."

At the age of 97, John still works daily in his lab and he hopes to still have another breakthrough before the end of his life.

"You don't have much time left, and you really want to be able to solve the problem.."

Reading some of John's words about discovery, I found many themes common to other innovative dyslexic people we've met. For example, John says he looks everywhere for new approaches to problems. "I've learned to be open to surprises and not to have preconceived ideas or listen or close your mind from listening to what might work." For instance, when an Italian engineering physics professor, Maria Braga brought a glass electrolyte to him to see, they began to work on how the electrolyte could be plated with metallic lithium or sodium for use in a battery.

Another interesting thing that John has mentioned about his life and way of thinking involves metaphors. In his author profile in the **Wiley library**, he listed his hobbies as "metaphors and parables of different cultures." He shares some other pearls in this biography:

"My motto is 'Let's take it one step at a time'. If your problem is to untie a complex tangle, the first step is to find a loose end where you can begin. Each step leads somewhere.

INSPIRATION

When I was eighteen I wanted to be able to return from World War II with the opportunity to go to graduate school to study physics. I had a classics and mathematics background, but I was impressed by the scientific method of intellectual exploration.

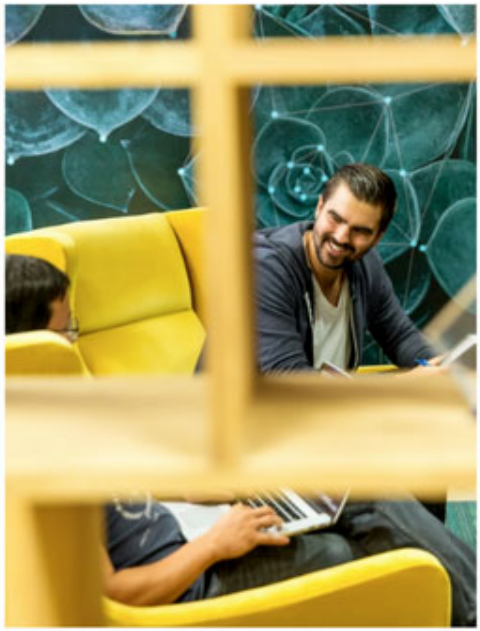
If I could be described as an animal it would be a tortoise. As a dyslexic child, I had to develop work habits that would allow me to overcome my handicap of being a poor reader.

The biggest challenge facing scientists is to develop a scientific intuition as well as technical skills. A scientist needs to develop confidence in the ability to ask penetrating questions and the ability to solve problems.

Science is fun because you are exploring creation and how nature works. The knowledge gained empowers mankind. But scientific knowledge is morally neutral, and science is fun when we use it to empower rather than to exploit one another or the bounty of the earth."

John has also shared how important his faith is to him. In the University of Chicago interview, he shared how he didn't fully embrace his faith until one night at Groton when a dream helped him "get the metaphor" of God is love.

"The feeling has stayed with Goodenough for more than eight decades. It's at the foundation of his work with batteries and his current quest for a superbattery. This is how he's loving his neighbor, and his God, he says —by using his talent and working with his colleagues to create something that could help safeguard the planet and improve people's lives."



DYSLEXICS NEED TO MEET THE DEMANDS OF THE FUTURE

CNBC recently had a welcome article about how important dyslexic employees are for increasing demands for creative thinking, design, and leadership. Their review was based on the Ernst and Young research paper The Value of Dyslexia.

Excerpt: "dyslexic individuals have differing abilities, with strengths in creative, problem solving and communication skills and challenges with spelling, reading and memorizing facts. Generally, a dyslexic cognitive profile will be uneven when compared to a neurotypical cognitive profile. This means that dyslexic individuals really do think differently.

What does this mean in work? These varied cognitive profiles give dyslexic individuals natural abilities to form alternative views and solve problems creatively. Heightened cognitive abilities in certain areas, such as visualization and logical reasoning skills and natural entrepreneurial traits can bring a fresh, often intuitive perspective."

CNBC commented: "The need for processing and manual capabilities like time management, reading, math and active listening were on the decline...Meanwhile, creative and social skills such as leadership, analytical thinking and technology design were increasingly in demand."

Nice to see more positive dyslexia awareness articles shared in the press. The more accomplished dyslexic individuals speak out at work, the easier it will be to find dyslexia-friendly workplaces.