

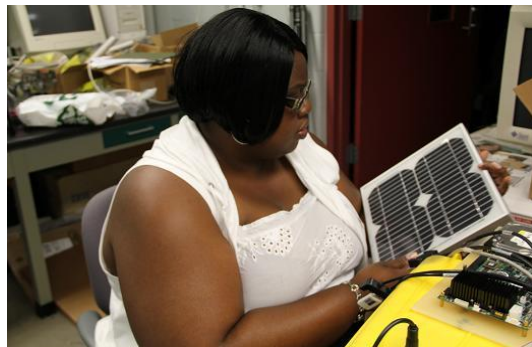
Going Beyond Research Experiences for Teachers

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**Train
K-12
Teachers**

**Increase
STEM
Students**

**Innovative
Curriculum &
Programs**

**Educated
Workforce**

**Future
Engineers**

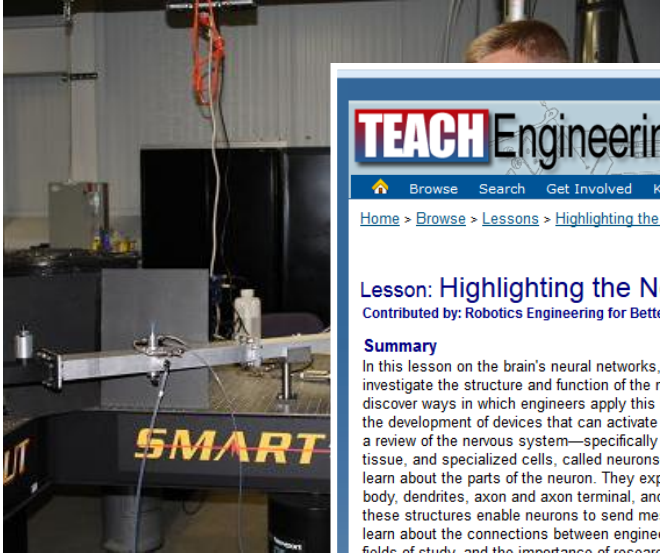
**Enhanced pool for
all STEM fields**

**21st
Century**

Discoveries



Research Experiences for Teachers



Authentic res

TEACH Engineering Resources for K-12

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Lesson: Highlighting the Neuron

Contributed by: Robotics Engineering for Better Life and Sustainable Future RET, College of Engineering, Michigan State University

Summary

In this lesson on the brain's neural networks, students investigate the structure and function of the neuron. They discover ways in which engineers apply this knowledge to the development of devices that can activate neurons. After a review of the nervous system—specifically its organs, tissue, and specialized cells, called neurons—students learn about the parts of the neuron. They explore the cell body, dendrites, axon and axon terminal, and learn how these structures enable neurons to send messages. They learn about the connections between engineering and other fields of study, and the importance of research, as they complete the lesson tasks.

Engineering Connection

●○○ Relating science and/or math concept(s) to engineering

Engineers who wish to develop prototypes to support the medical field require a foundational understanding of many biological processes, such as the ability for neurons to

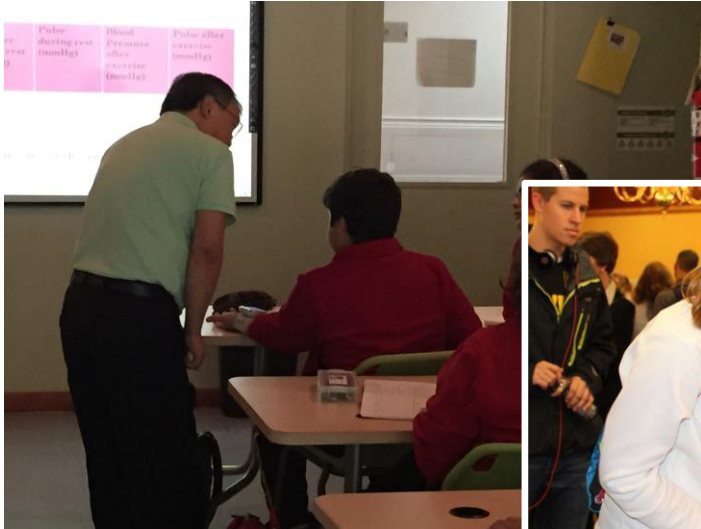
Engineers use a

Innovative curr



Transition to classroom

Beyond RET: Comprehensive School – University Partnership



School visits



Design Day exp



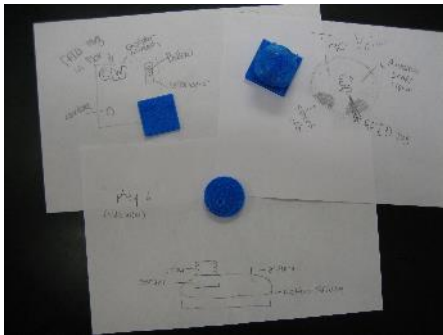
Robotics competition

Impact on recruiting of incoming engineering students:

- ACT average increases from 23/24 in 2005 to 29/30 in 2015
- 35% and 23% increase for women and minorities from 2014 to 2015

Shifting Classroom Culture

“You are biomedical engineers...”



“You are civil engineers...”



“You are structural engineers....”



Shifting School Culture

Impact on the Future

60% of 7th grade students have changed the way they feel and think about STEM learning



78% of 7th grade students feel as if they could work in a STEM-related career

59% of 7th grade students are considering a STEM-related career