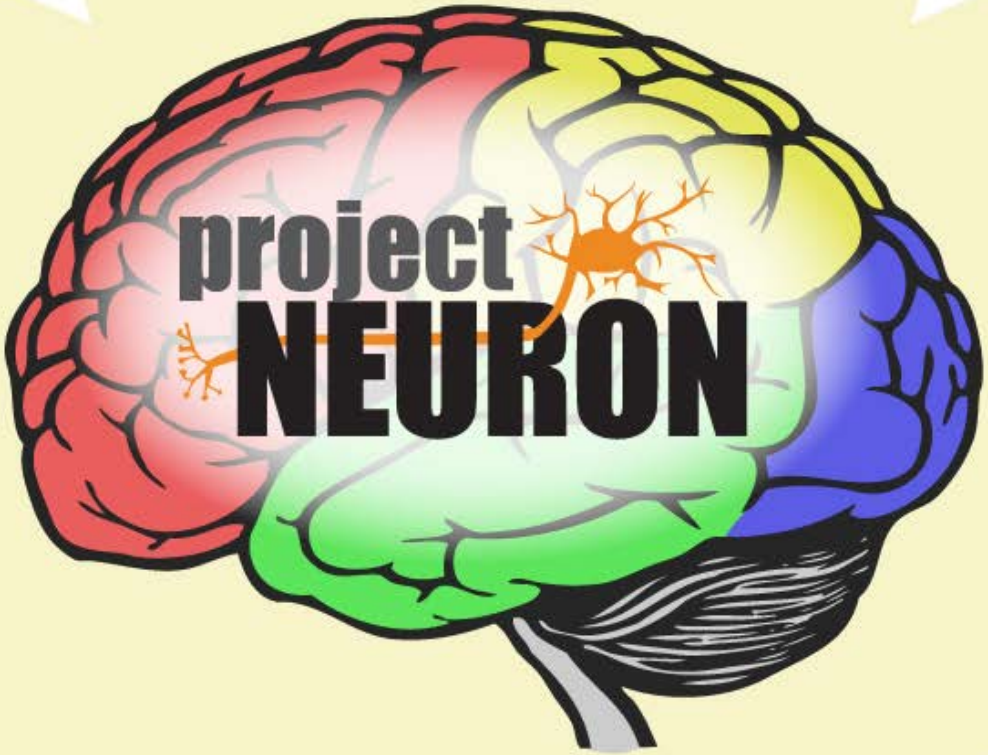
Engage Your Students in Science with a Unit on Circadian Rhythms



Robert Wallon
Barbara Hug
University of Illinois

NIH
National Institutes of Health

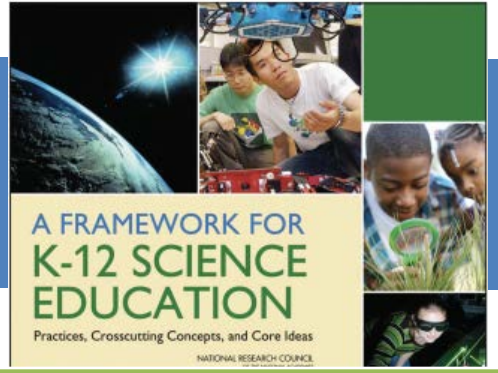
SEPA SCIENCE EDUCATION PARTNERSHIP AWARD
Supported by the National Institutes of Health

Project NEURON Curriculum Units

- **Do you see what I see?**
  - *Light, sight, and natural selection*
- **What can I learn from worms?**
  - *Regeneration, stem cells, and models*
- **What makes me tick...tock?**
  - *Circadian rhythms, genetics, and health*
- **What changes our minds?**
  - *Toxicants, exposure, and the environment*
  - *Foods, drugs, and the brain*
- **Why dread a bump on the head?**
  - *The neuroscience of traumatic brain injury (TBI)*
- **Food for thought: What fuels us?**
  - *Glucose, the endocrine system, and health*
- **What makes honey bees work together?**
  - *How genes and environment affect behavior*
- **How do small things make a big difference?**
  - *Microbes, ecology, and the tree of life*

Available (for free) at:
neuron.illinois.edu

A Framework for K-12 Science Education



Dimension 1: Scientific & Engineering Practices	Dimension 2: Crosscutting Concepts	Dimension 3: Disciplinary Core Ideas
1. Asking questions 2. Developing/Using models 3. Planning/Carrying out investigations 4. Analyzing & interpreting data 5. Using math, information and computer technology, and computational thinking 6. Constructing explanations 7. Engaging in argument from evidence 8. Obtaining, evaluating, communicating information	1. Patterns 2. Cause and Effect 3. Scale, Proportion, and Quantity 4. Systems and System Models 5. Energy and Matter 6. Structure and Function 7. Stability and Change	1. Physical Sciences 2. Life Sciences 3. Earth and Space Sciences 4. Engineering, Technology and Applications of Science

New Standards

Crosscutting Concepts

Core Ideas

Practices

NEXT GENERATION SCIENCE STANDARDS

Are you an Owl or a Lark?

Image obtained from http://www.novosbed.com/blog/lark-meets-owl-how-to-tell-if-your-sleep-style-is-jeopardizing-your-relationship/

project NEURON

What makes me tick…tock?

Circadian rhythms, genetics, and health

- Lesson 1: What is a circadian rhythm?
- Lesson 2: Why do scientists study fruit flies to understand what makes us “tick”?
- Lesson 3: How can genetics change your clock?
- Lesson 4: Tick tock...Broken clock

What makes me tick…tock?

Circadian rhythms, genetics, and health

- Lesson 5: How do environment and modern society influence our rhythms?
- Lesson 6: What happens to humans when normal rhythms are disrupted?
- Lesson 7: How can epigenetics change your clock?
- Lesson 8: When should the school day begin?

What makes me tick…tock?

Circadian rhythms, genetics, and health

- Lesson 1: What is a circadian rhythm?
- Lesson 2: Why do scientists study fruit flies to understand what makes us “tick”?
- Lesson 3: How can genetics change your clock?
- Lesson 4: Tick tock...Broken clock

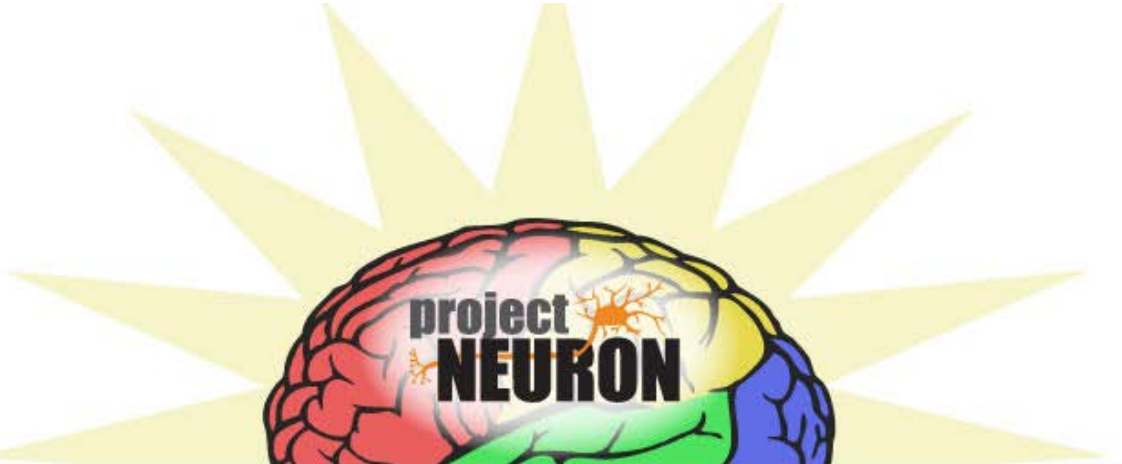
Try it!

- Try the student activity (~10 min.)
- Review a copy of the lesson plan (~5 min.)
- Reflect and be ready to discuss:
  - How would you use this learning activity in your class?
  - How does the activity relate to scientific and engineering practices from The Framework?

Free Curriculum Materials

- All curriculum materials featured in our session can be found online for free at:

http://neuron.illinois.edu/



ILLINOIS

Search

Log in/Create account

project NEURON

Curriculum Units | Professional Development | Games & Videos | Additional Projects | About

Project NEURON

Novel Education for Understanding Research on Neuroscience

Project NEURON develops curriculum materials for middle and high school teachers to use in their science classrooms. Each unit addresses various science education standards, including the Next Generation Science Standards, within the context of neuroscience topics and research performed on the University of Illinois campus.

All of our completed materials, which have been classroom-tested and revised, are available on this website to teachers and educators for free. For teachers who wish to engage with our materials hands-on, we also provide professional development opportunities through local workshops and national teaching conferences such as NSTA.

Our materials have been adapted and expanded to be used with younger grades, outreach, and informal education. To learn more about our collaborative projects, please visit the Additional Projects page.

Please note that we are continuously improving this website and the materials hosted here. We work hard to create quality materials, but if you notice any inconsistancies, missing materials, etc., please let us know! We also love to hear suggested improvements or adaptations from teachers who have used our materials!

News and Events

Find us at the Illinois Science Education Conference!

October 14, 2013

Join us at the Illinois Science Education Conference, October 24-26!

New team member provides opportunities for NEURON growth

September 30, 2013

Most of us can remember at least one teacher who could make even the most tedious subjects fun and exciting. For Sahid Rosado Lausell, one of the best teachers she ever had was her high school math teacher. "He was a really cool guy who was in a band, had tattoos, and dyed his hair," she says.

NEURON gaining recognition in the neuroscience

n-conference

Acknowledgements

- SEPA, NIH
- University of Illinois

This project was supported by SEPA and the National Center for Research Resources and the Division of Program Coordination, Planning, and Strategic Initiatives of the National Institutes of Health through Grant Number R25 RR024251-03. The contents of this video are solely the responsibility of Project NEURON and do not necessarily represent the official views of the funding agencies.

Contact Information

- Rob Wallon
  - rwallon2@illinois.edu
- Barbara Hug
  - bhug@illinois.edu