

# Welcome to the Durable Learning Seminar Series



**Peter Horneffer, MD**

Executive Dean, All American Institute  
of Medical Sciences, Jamaica

Director of Medical Education,  
Lecturio

Cardiothoracic Surgeon  
Maryland, USA



# Meet Our Learning Science Team

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Peter Horneffer



Eleonora Merker



Satria Nur Sya'ban



Adonis Wazir

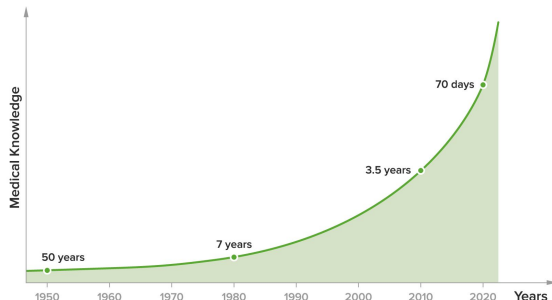


Leigh Foy

# Durable Learning Seminar Series

## (1) How to Ensure Durable Learning in Medical Education

- Explosion of medical knowledge
- Changing role of medical educators



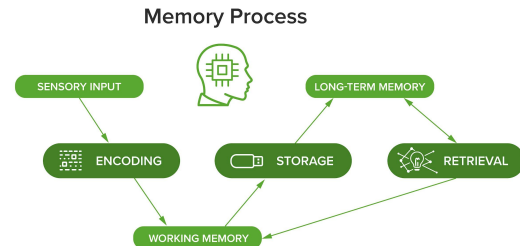
## (2) How to Apply Evidence to Tackle Misconceptions in Medical Education

- History of learning and BEME approach
- Common misconceptions in medical education

Conventions	Evidence-Based
Traditional didactic lectures are an appropriate and cost-effective way to teach medicine	Sessions focused on having students retrieve and elaborate, not simply receive information, are far more effective
Students learn best using their preferred learning styles	Students learn best using a variety of styles, not by accommodating their learning style preferences
Highlighting text passages is the best way to remember something	To be beneficial, highlighting must be strategic and guided by clearly defined objectives
Studying all material close to an exam (cramming) can help students recall it better during the exam	Massed practice, as used in cramming, can produce positive results in the short term and feels effective, but leads to poor long term retention

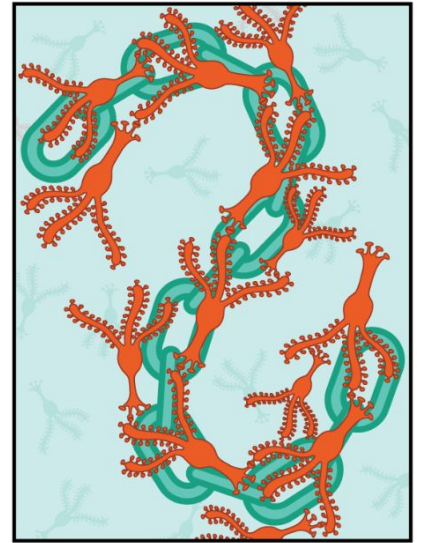
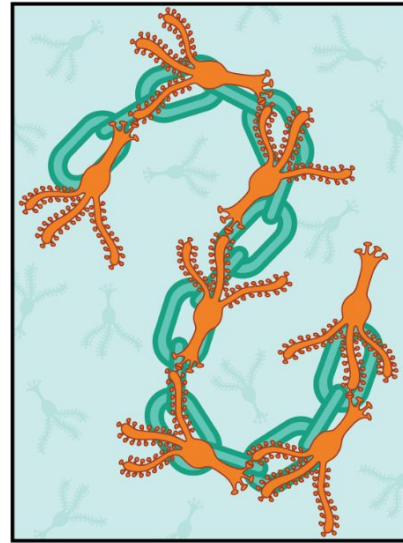
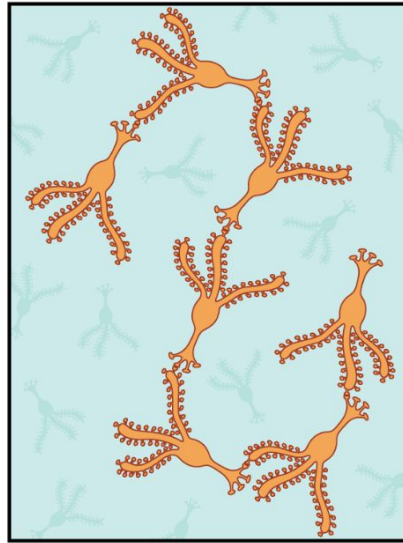
## (3) Understanding Memory to Enhance Learning in Medical Education

- Role of memory and its types in medical education
- Memory process and memory-enhancing learning strategies



# Learn It, Link It, Keep It Linked

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Learn it

Link it

# Domains and Application of Learning Science

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## Dr. Barbara Oakley

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Distinguished Professor of Engineering,  
Oakland University, Rochester, Michigan

Creator of the world's most popular online  
course "Learning How to Learn"

Author of multiple books and articles,  
including "Uncommon Sense Teaching"  
and "Learn like a Pro"



"A good teacher will leave you educated, but a great teacher will leave you curious. Well, Barbara Oakley is a great teacher. Not only does she have a mind for numbers, she has a way with words, and she makes every one of them count."  
—Mike Rowe, creator and host of Discovery Channel's *Dirty Jobs* and CEO of *MikeRoweWORKS*

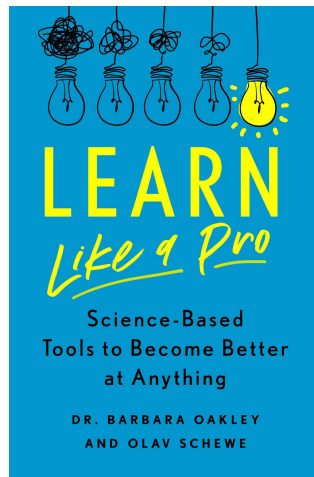
# $a\left(\frac{\text{MIND}}{\text{for}}\right)=$ NUMBERS



A Companion to  
COURSEWORK's  
popular online  
course *Learning  
How to Learn*

HOW TO EXCEL AT  
MATH AND SCIENCE  
(Even If You Flunked Algebra)

BARBARA OAKLEY, Ph.D.



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## Learning How to Learn: Powerful mental tools to help you master tough subjects

★★★★★ 4.8 75,550 ratings



Barbara Oakley [+1 more instructor](#) [TOP INSTRUCTORS](#)

Go To Course

Already enrolled  
Financial aid available

2,969,341 already enrolled

## UNCOMMON SENSE TEACHING



Practical Insights in  
Brain Science to  
Help Students Learn

From the Creators of the Popular Online Course *Learning How to Learn*

Barbara Oakley, PhD; Beth Rogowsky, EdD;  
Terrence J. Sejnowski, PhD

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## Uncommon Sense Teaching

★★★★★ 4.9 71 ratings



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Already enrolled  
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Lecturio

# Neuroscience of Learning: Insights for Better Learning, Remembering, and Motivation

September 22, 2021  
Online Seminar

# Seminar Learning Outcomes

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1

Participants will be able to **understand** the critical role of working memory in keeping students engaged and focused.

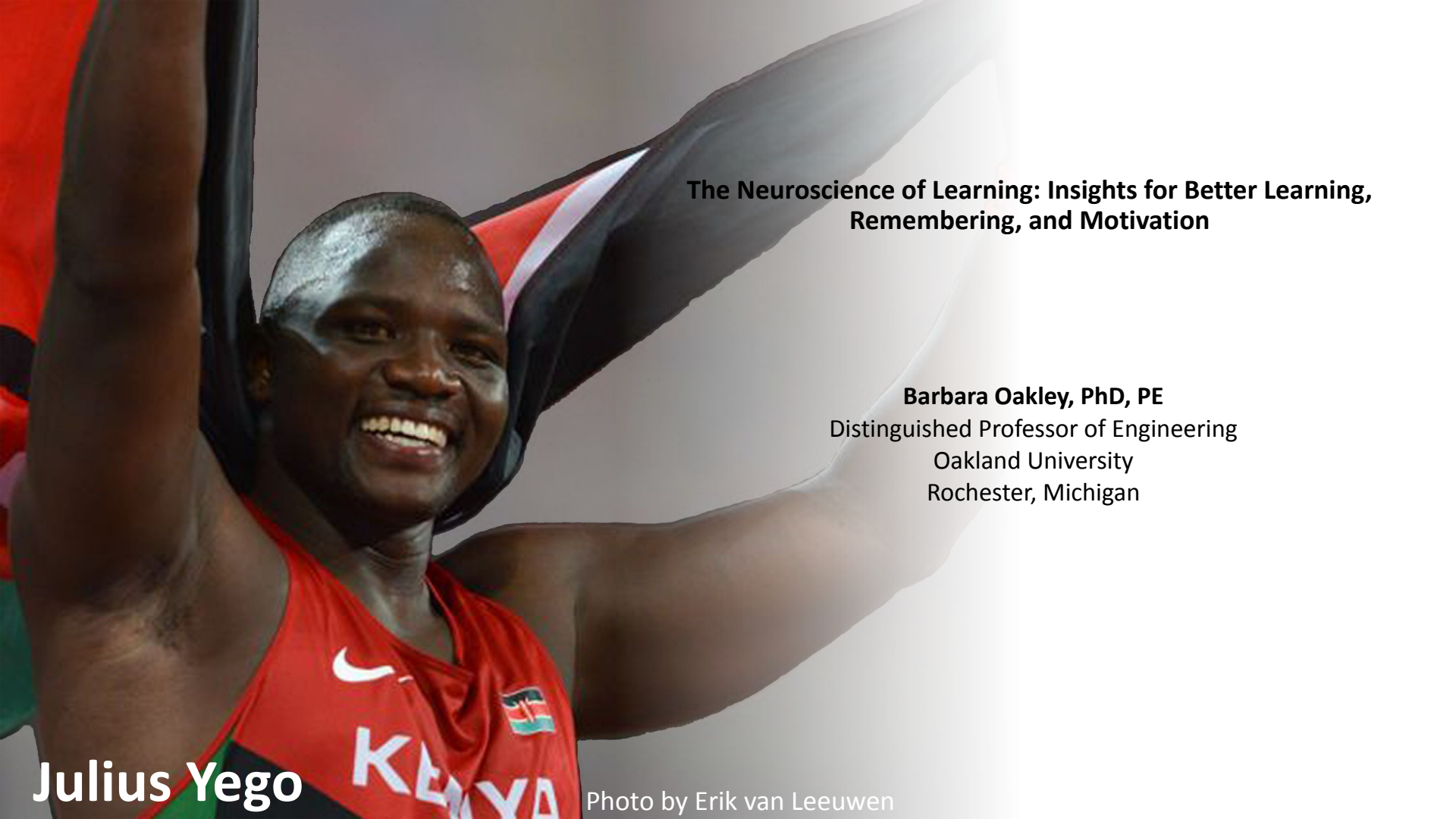
2

Participants will be able to **define** the neurochemical difference between expected and unexpected rewards and their role in motivation and durable learning.

3

Participants will be able to **integrate** practical recommendations for engaging their students in the physical and digital classroom.

Dr. Barbara Oakley



**The Neuroscience of Learning: Insights for Better Learning,  
Remembering, and Motivation**

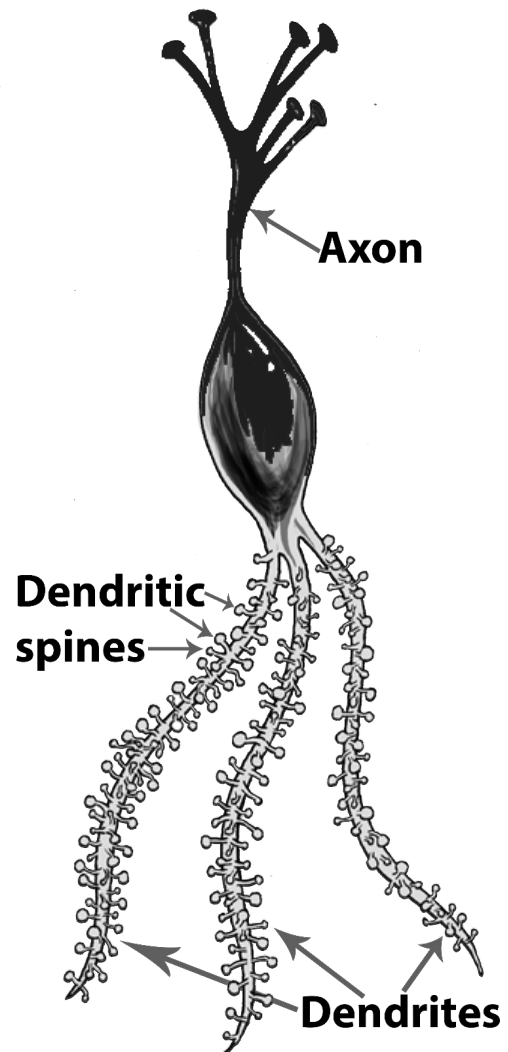
**Barbara Oakley, PhD, PE**

Distinguished Professor of Engineering  
Oakland University  
Rochester, Michigan

**Julius Yego**

Photo by Erik van Leeuwen

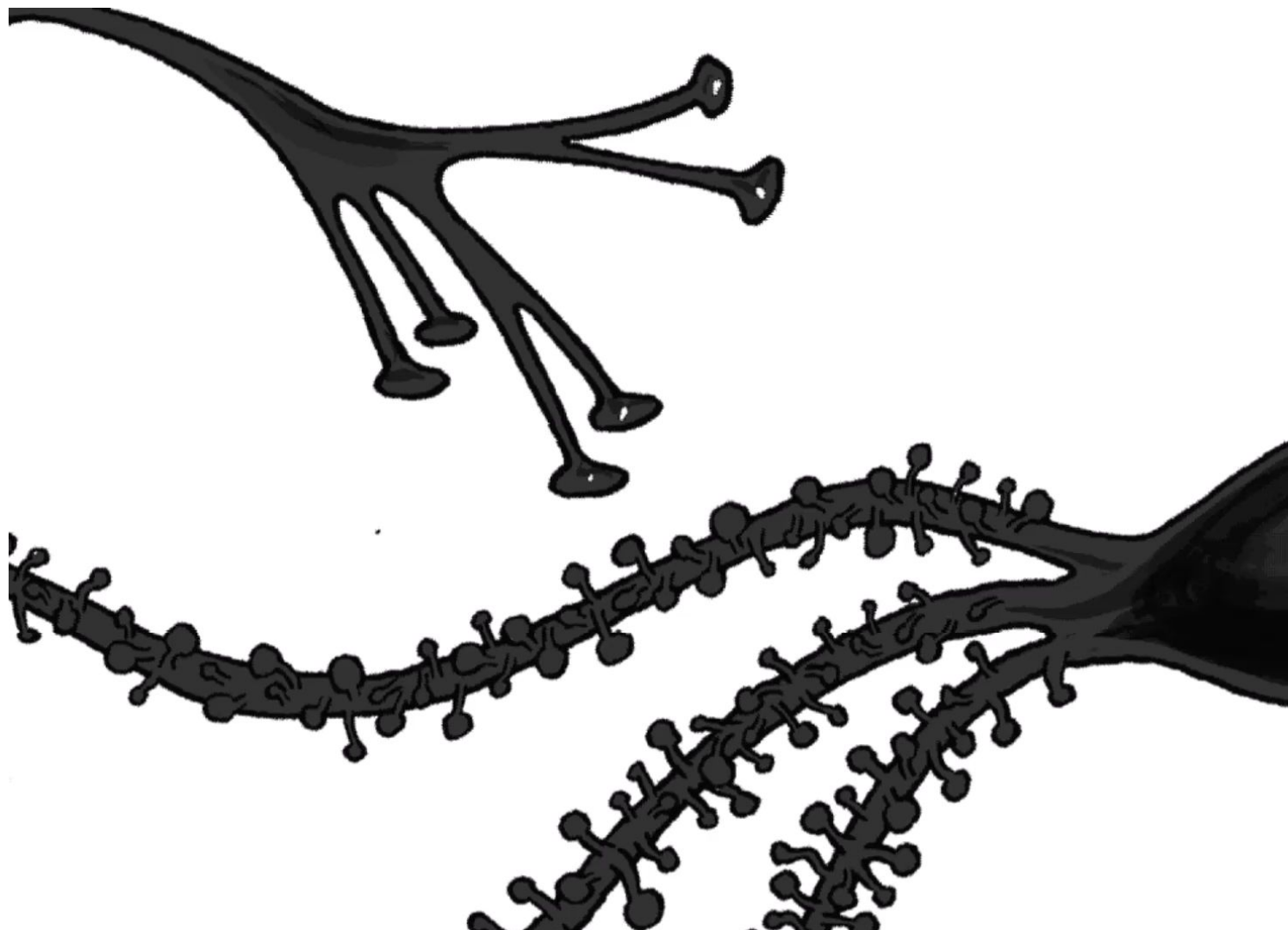




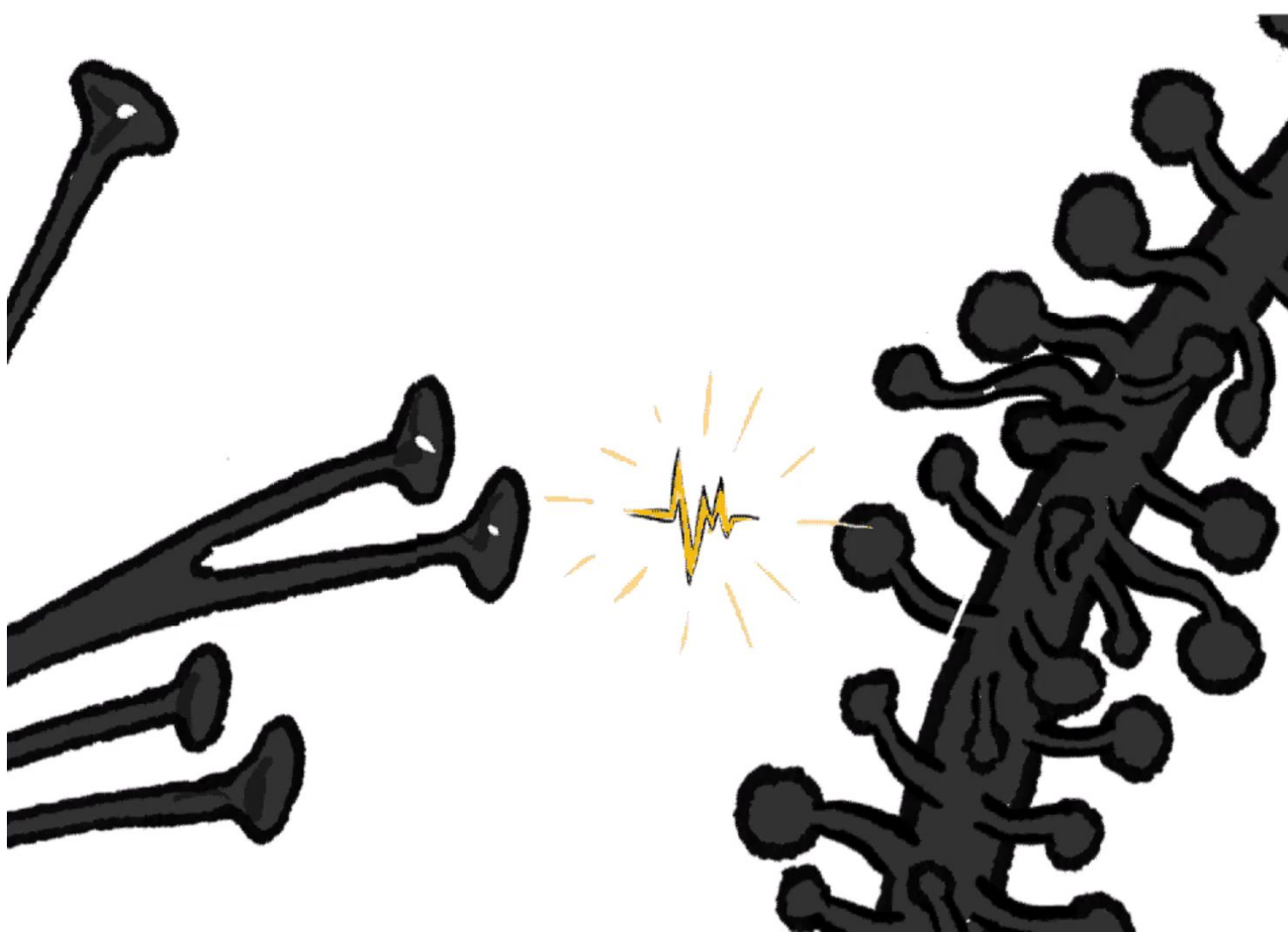


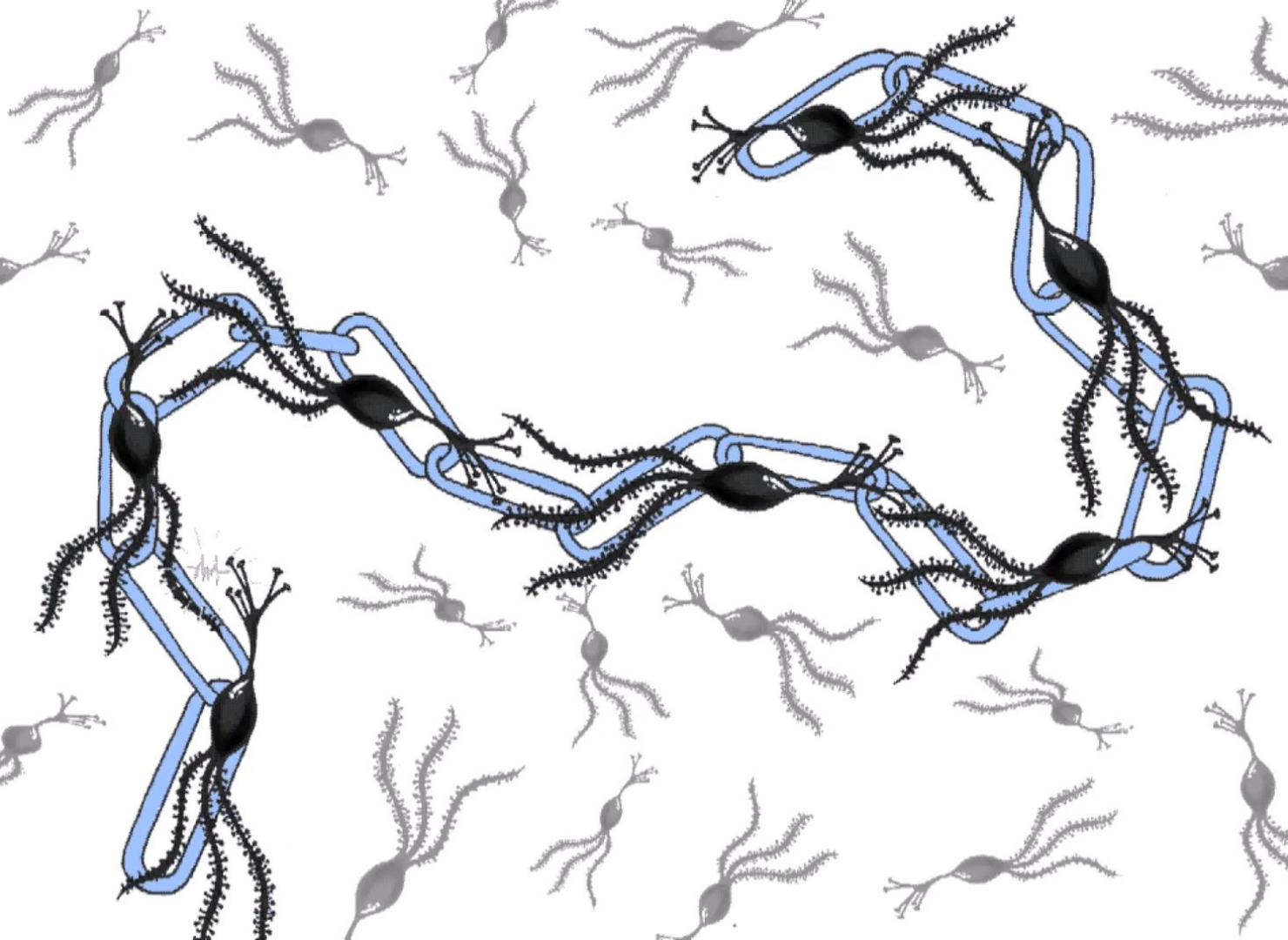


Neurons  
create sets of  
links when you  
learn  
something.



Connections  
strengthen  
with practice





These are  
like sets of  
links

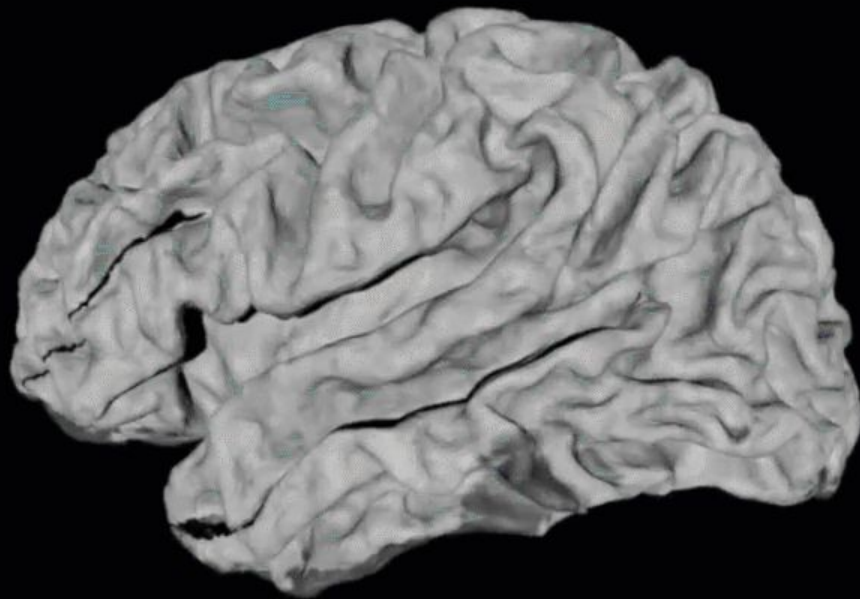
# The Neocortex



# The Neocortex

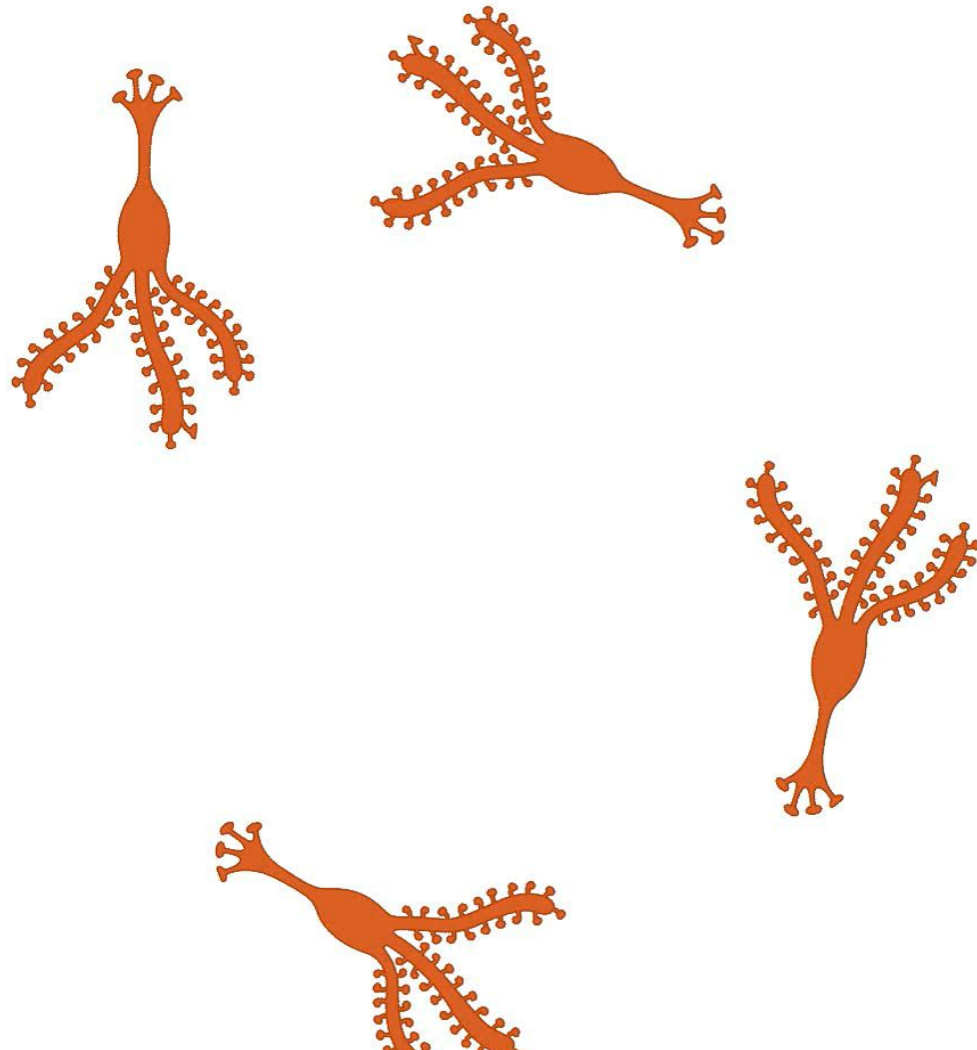


# The Neocortex



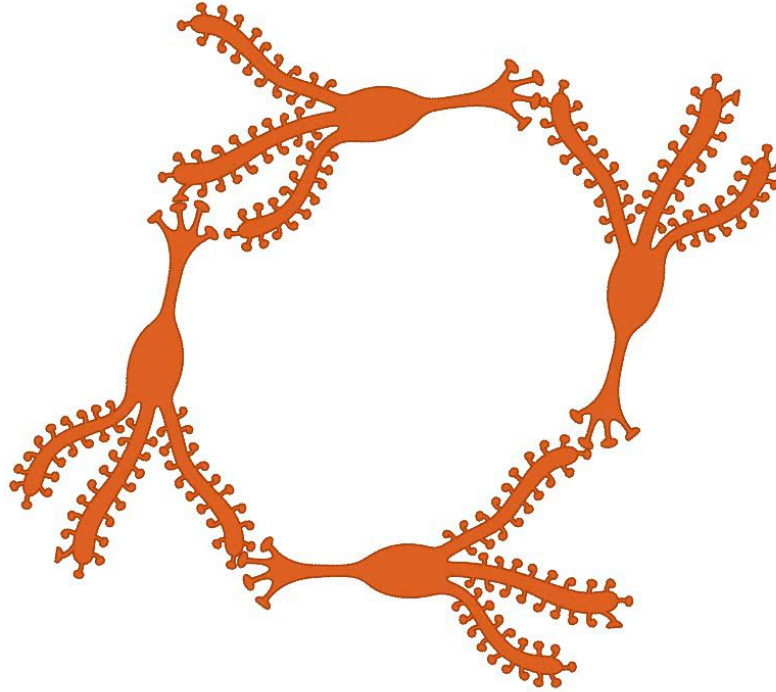
Courtesy Alexander  
Huth

## Neuron shorthand

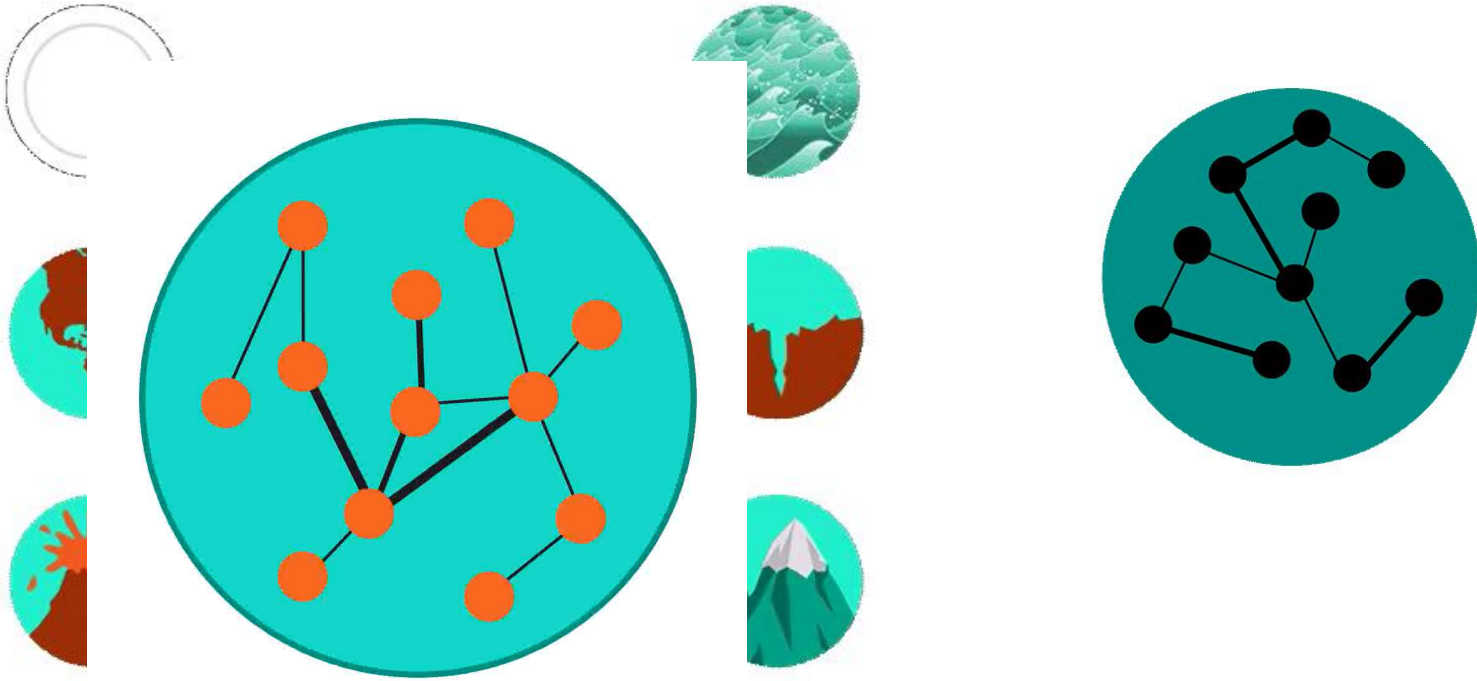




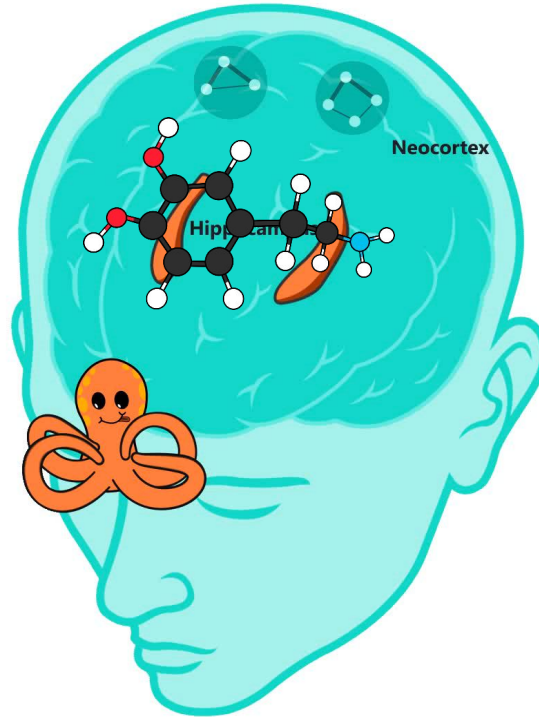
# Neuron shorthand

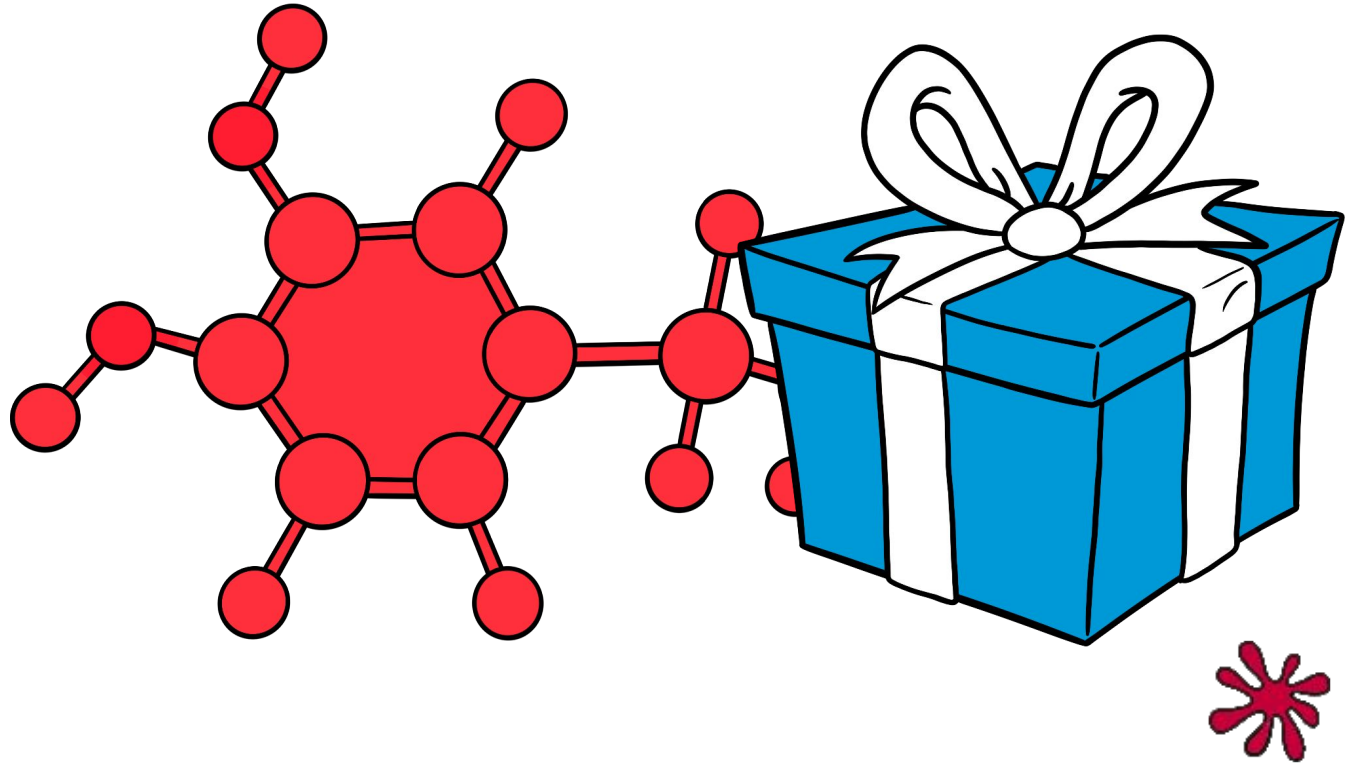


## Consolidation

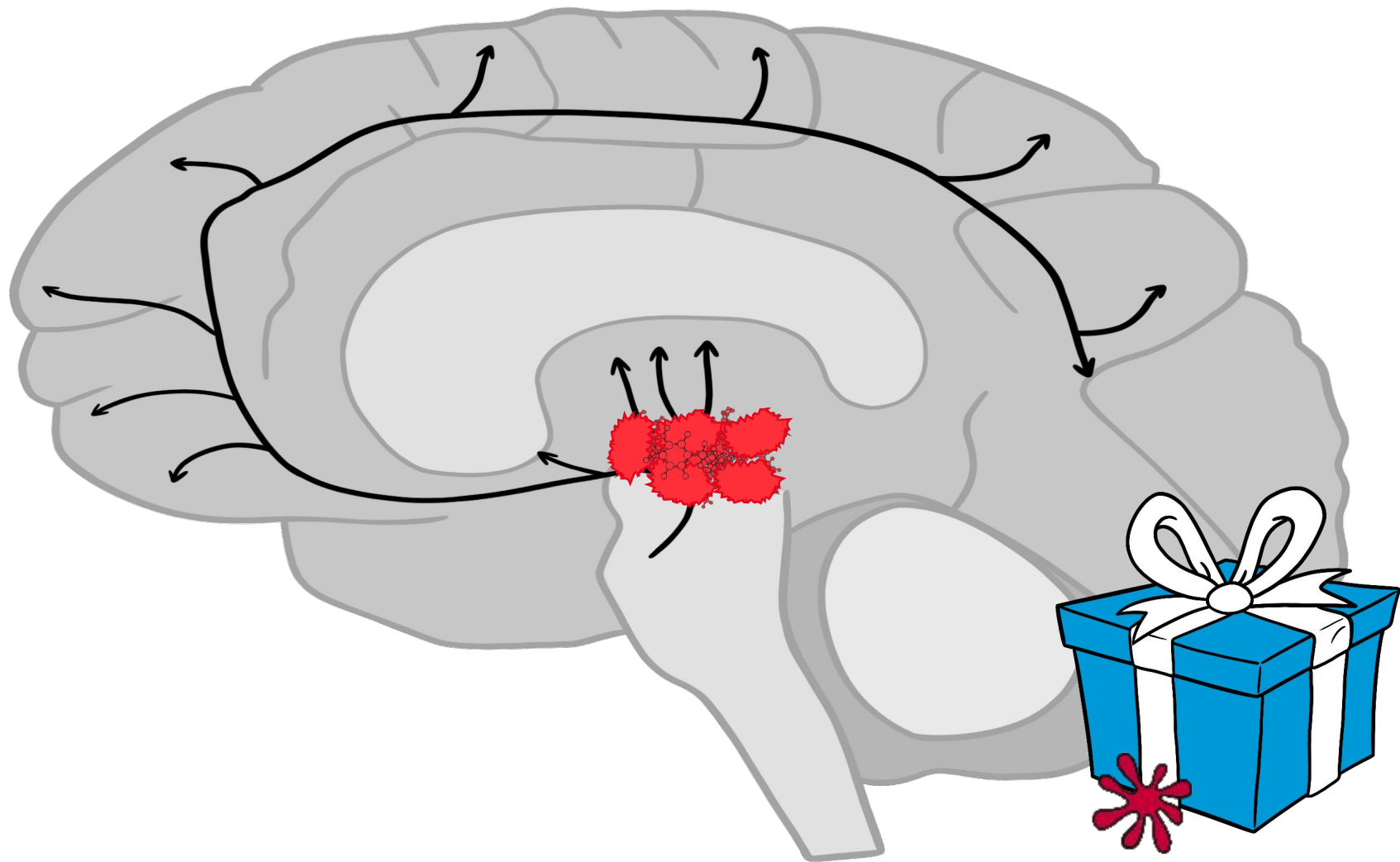


## Consolidation





Dopamine—the “feel good molecule”



# \* Two “flavors” of dopamine

- **Tonic:** Helps with motivation.  
Always there, more or less.

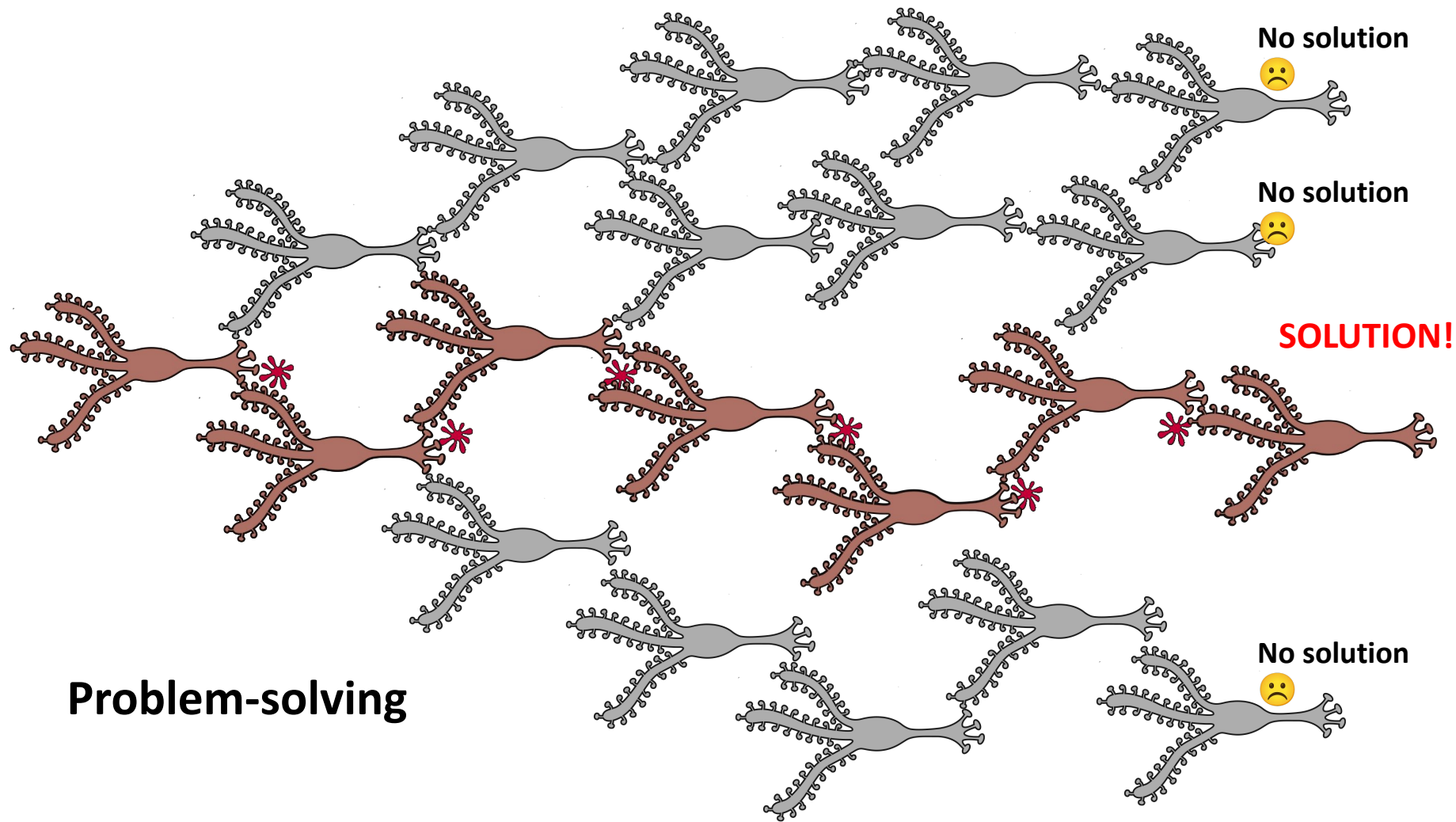
- **Phasic** Unexpected rewards—  
Prediction errors. Helps with learning.





Mice with damaged dopamine systems *can't learn anything new.*





**CURIOSITY IS KING**

**Lead with a *hook***

**MOTION IS THE MONARCH**



# Engaging Your Students

- Students in online courses look first at the videos.
- But we want them to *engage*.

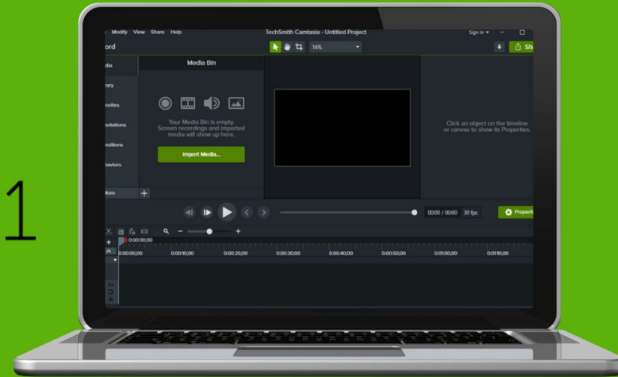
“Zero-ith” Rule of Making Engaging  
Online Courses

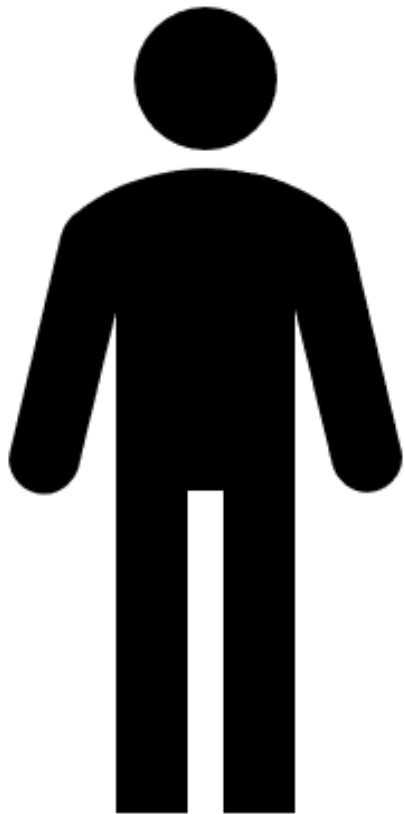
# Make a BAD video



Camtasia® 2021

Great videos. Less time.

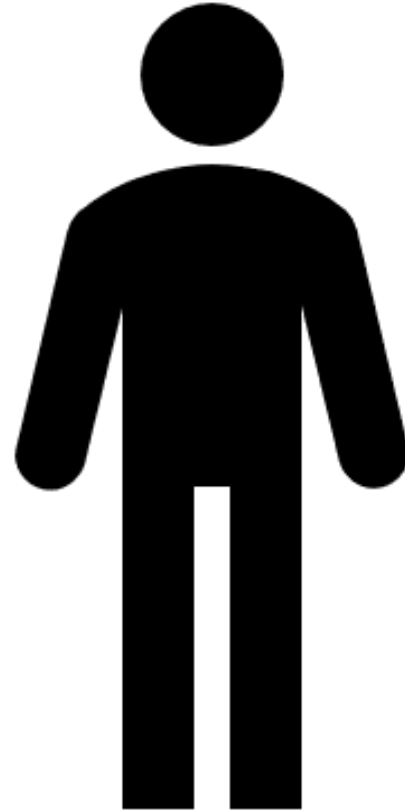




- Blah blah blah blah
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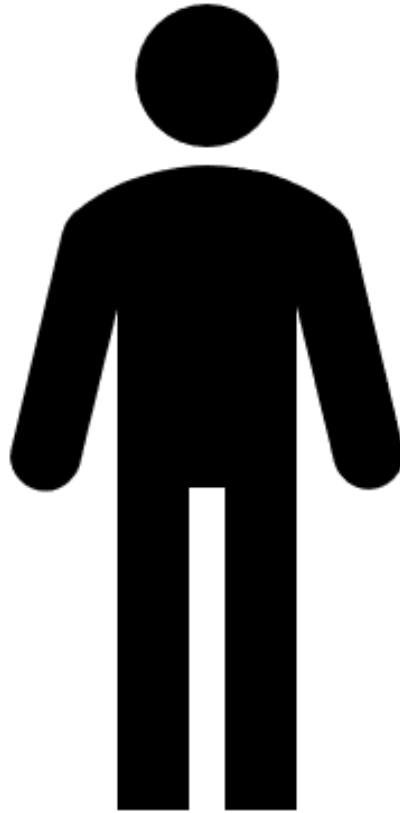


- Blah blah blah blah
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# The value of looming motion



# The value of looming motion



Lecture

Active  
Learning

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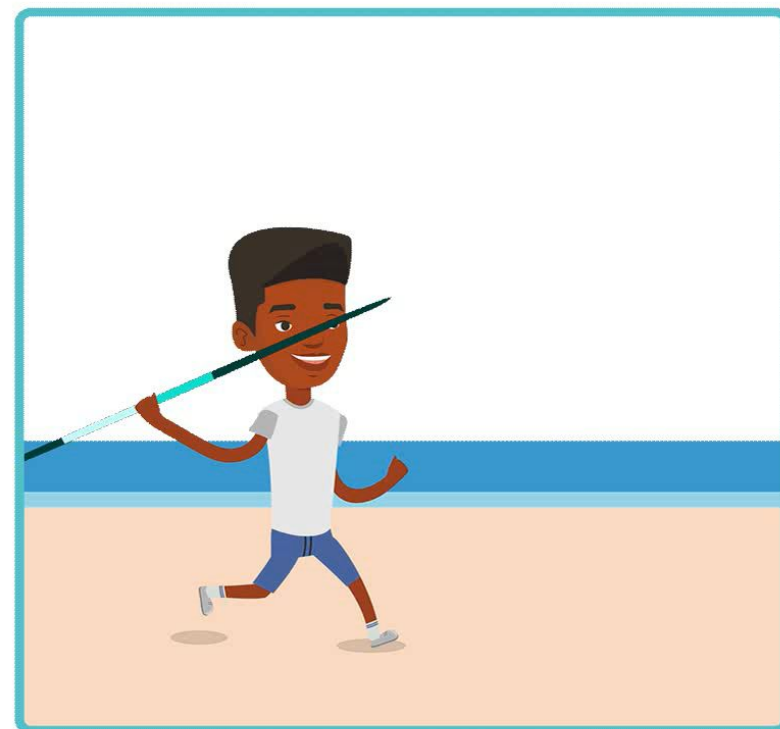
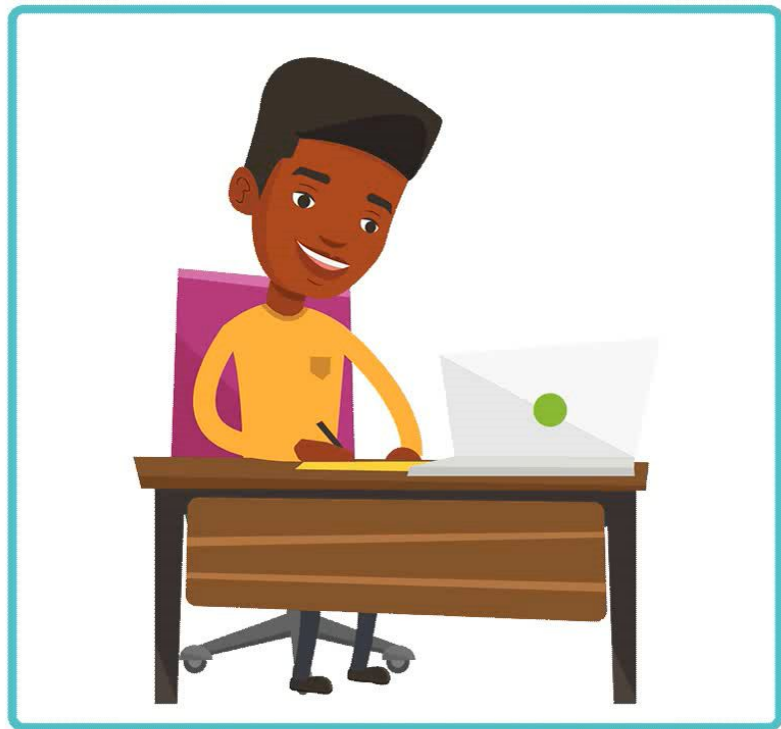
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**Direct instruction**



Photo by Erik van  
Leeuwen

Julius Yego



Lecture

Active  
Learning

Lecture

Active  
Learning

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Learning

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**DECLARATIVE**

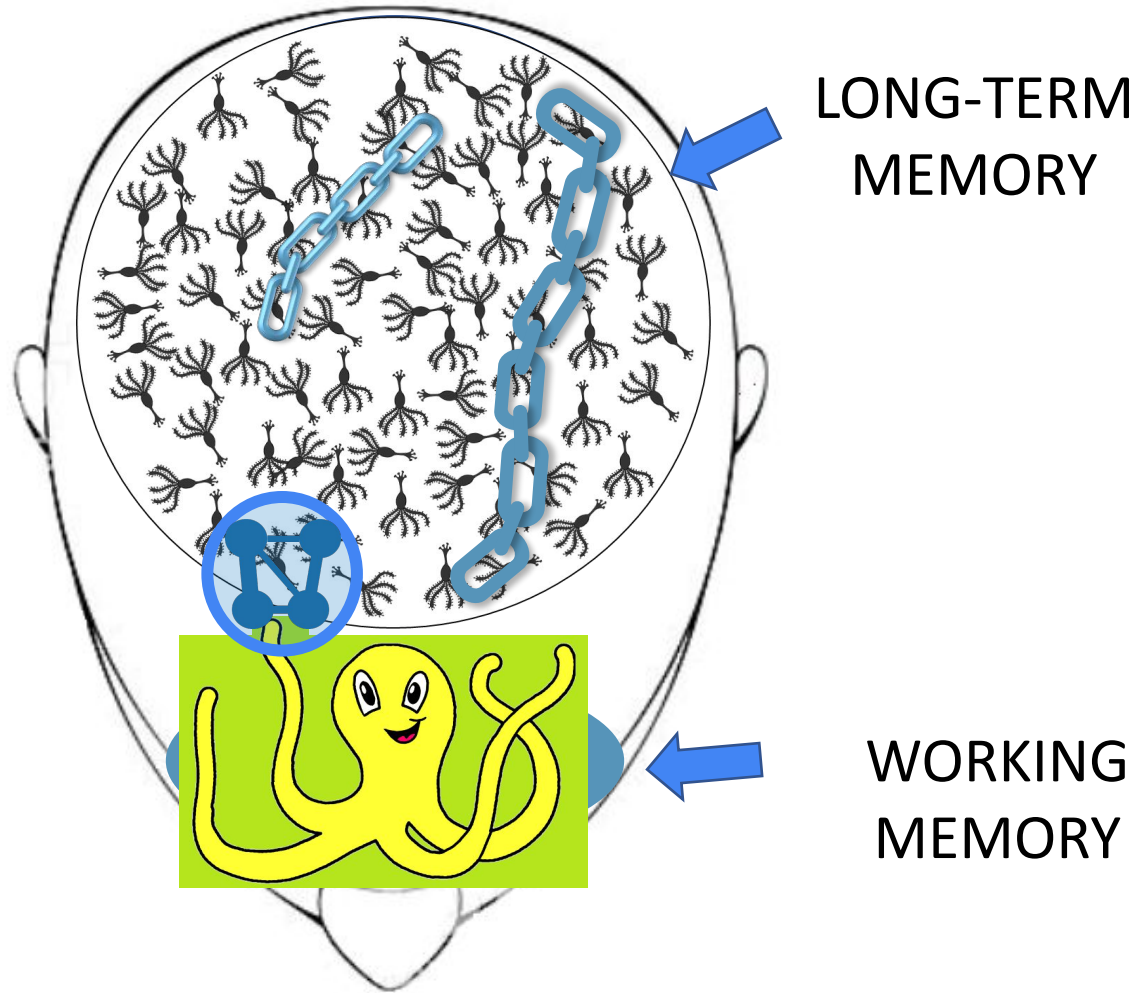


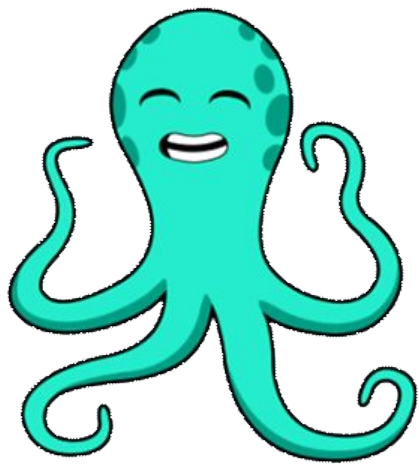
**HIPPOCAMPUS**

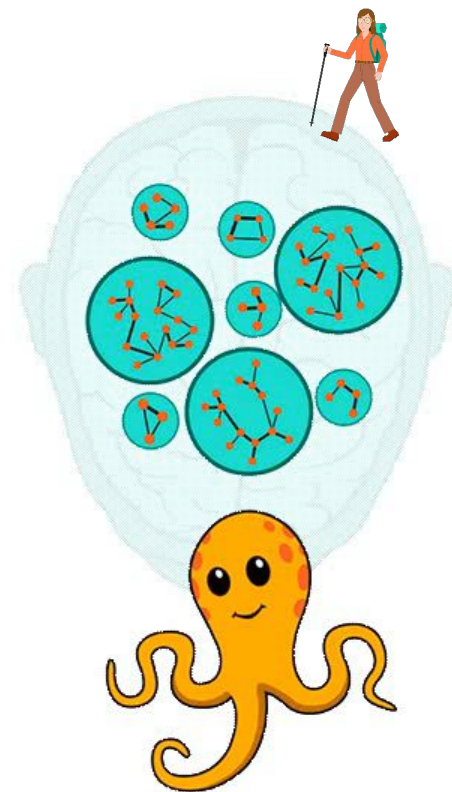
**BASAL GANGLIA**

**PROCEDURAL**

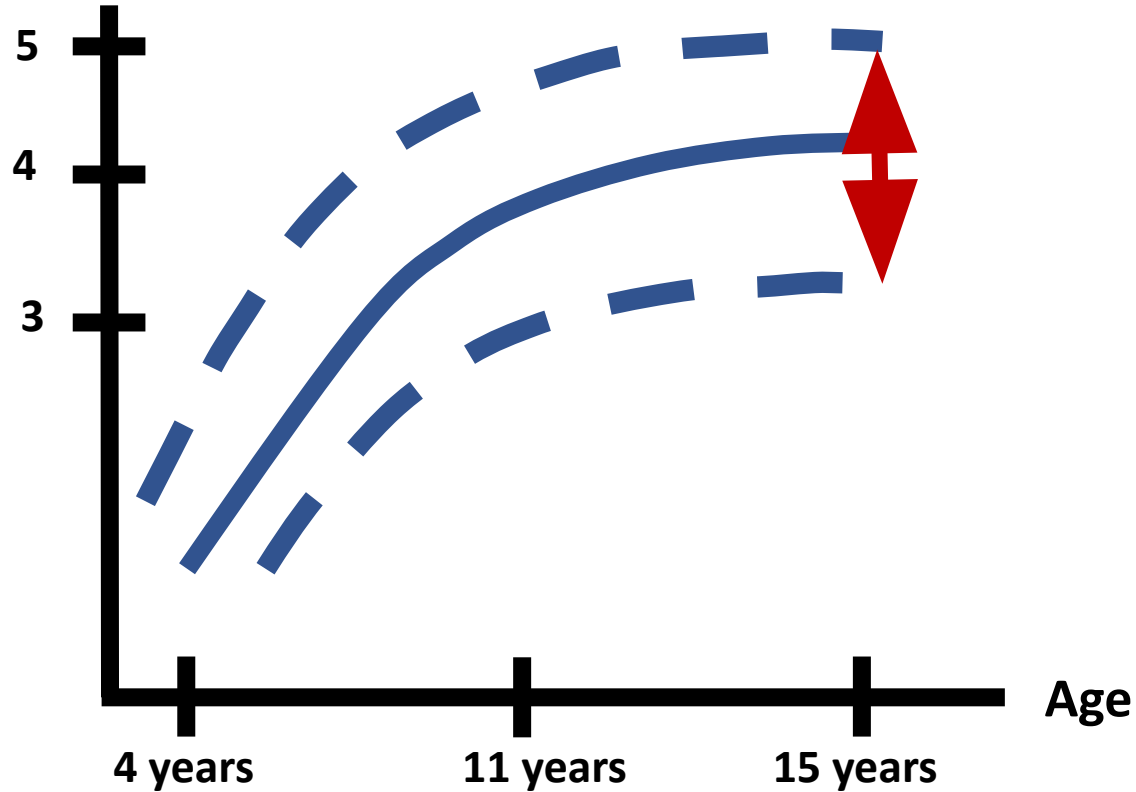






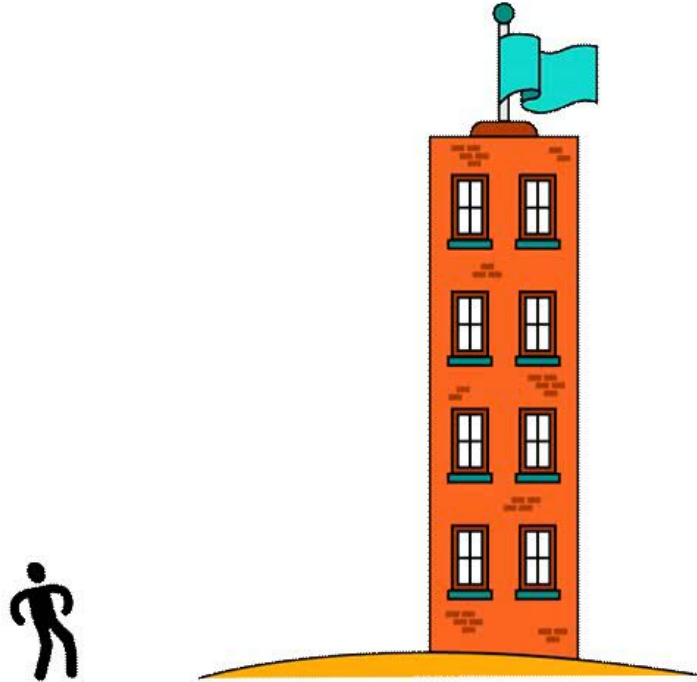


**Working memory capacity  
(pieces of information)**



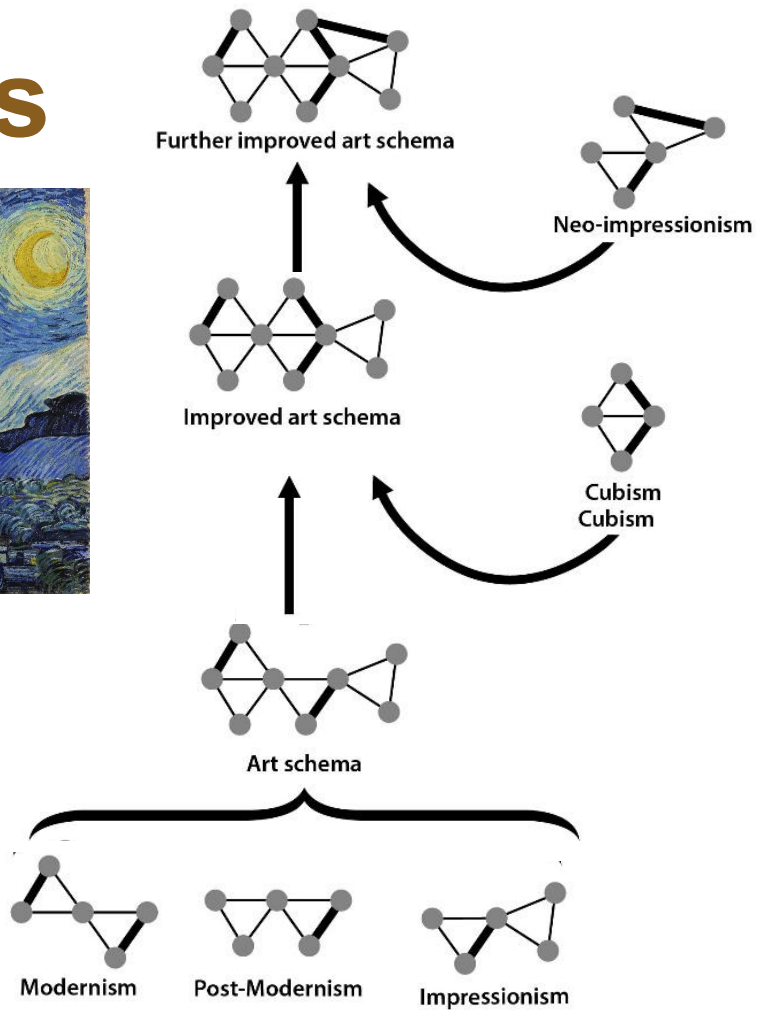
**Changes in working memory capacity with age**

# The value of scaffolding



- Small chunks
- Practice

# Schemas





Browse > Social Sciences > Education

# Uncommon Sense Teaching



Barbara Oakley [+2 more instructors](#)

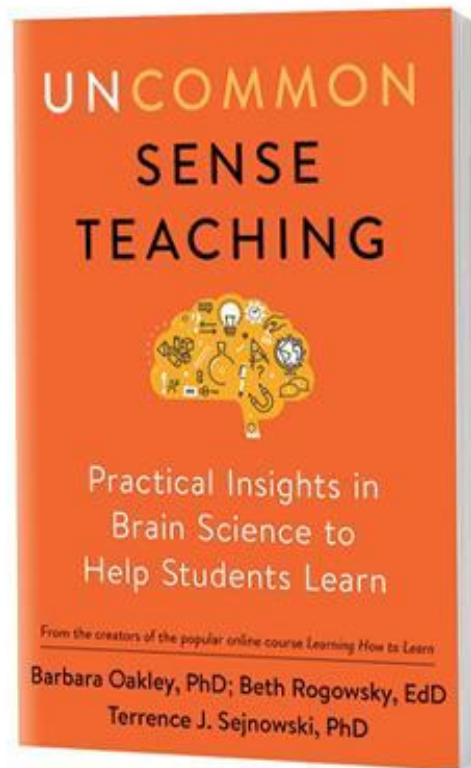
TOP INSTRUCTOR

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Already enrolled



Save



**FREE online course with *much* more:**  
**[www.coursera.org/learn/uncommon-sense-teaching](http://www.coursera.org/learn/uncommon-sense-teaching)**





Q & A

# Discussion

## Poll

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What techniques have you used to enhance durable learning and memory for your students?

## Discussion Question

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How do you implement evidence-based techniques such as spaced retrieval into your teaching methodology?

## Discussion Question

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How do you encourage and motivate your students?

## Discussion Question

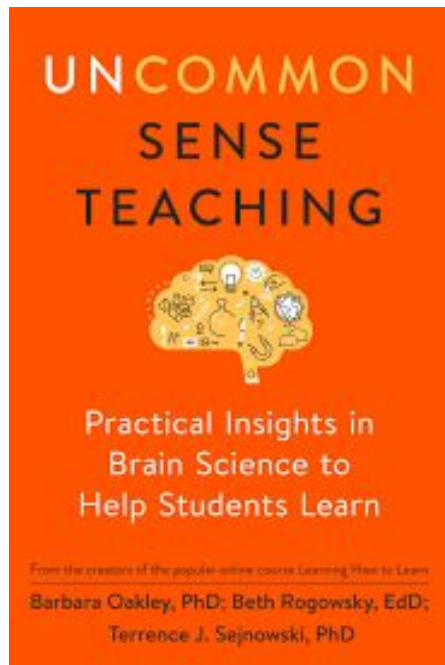
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What are the differences in teaching approaches to consider in a physical versus an online classroom?

# Our Upcoming Events

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**Save the date** for the next seminar in the Durable Learning series:

## **Spacing and Interleaving for Better Learning**

12:00 EDT | 18:00 CEST, **October 20**, 2021

**Are you interested in contributing to Learning Science?**

**Join the Lecturio Learning Science team's research endeavours!**

Contact us: [lecturio-science@lecturio.com](mailto:lecturio-science@lecturio.com)



Contact us

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Learning Science Team  
[learning-science@lecturio.com](mailto:learning-science@lecturio.com)