

# NORTHWEST NOGGIN

Southwest Oregon  
Economic Summit,  
May 2025

## ENGAGING BRAINS!

SOUTHWESTERN  
OREGON  
ECONOMIC SUMMIT

Engaging Noggins  
Wednesday (5/14)  
nwnoggin.org



GO PLACES  
EXAMINE BRAINS  
ASK QUESTIONS  
MAKE ART

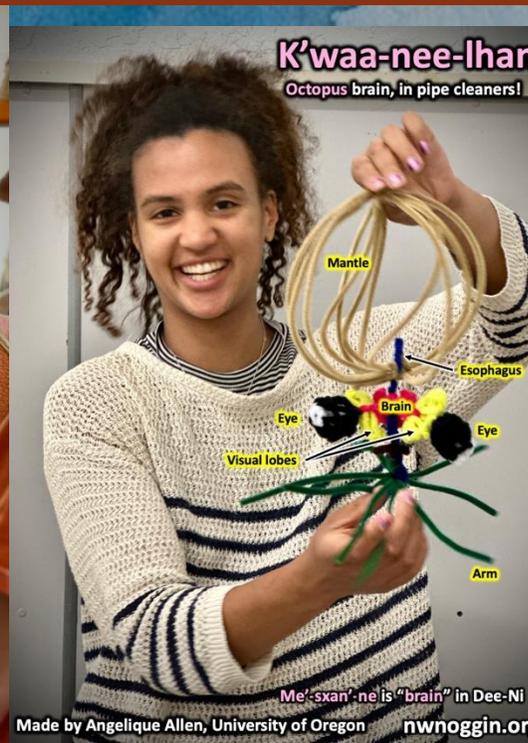


Teaching Matters

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**K'waa-nee-lhan**  
Octopus brain, in pipe cleaners!



Me'-sxaan'-ne is "brain" in Dee-Ni

Made by Angelique Allen, University of Oregon nwnoggin.org



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# ALL VOLUNTEER

THIRTEEN YEARS (SINCE 2012)!

NO ADMISSION - NO TUITION - OPEN TO EVERYONE

75,000+ PUBLIC K12 STUDENTS/COMMUNITY MEMBERS

LOCAL/NATIONAL/INTERNATIONAL COLLABORATORS



# GO PLACES

- WHERE STEM PROGRAMS DON'T GO
- WHERE MONEY AND RESOURCES DON'T GO
- K12 PUBLIC SCHOOLS
- RURAL AND URBAN COMMUNITIES
- HOUSELESS YOUTH NONPROFITS
- CORRECTIONAL FACILITIES

Siletz, Amity & Willamina, OR  
Pop: 4000

Davenport, WA  
Pop: 1700

Astoria, OR  
Pop: 10,000

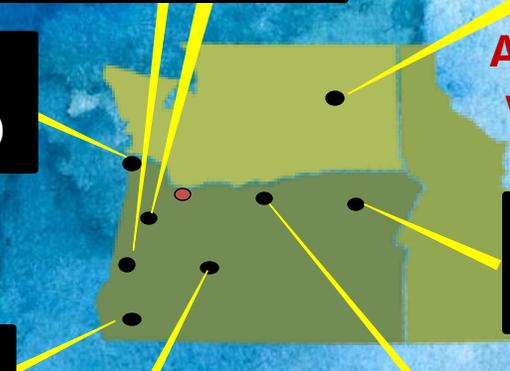
*A few places we've been*

La Grande, OR  
Pop: 13,000

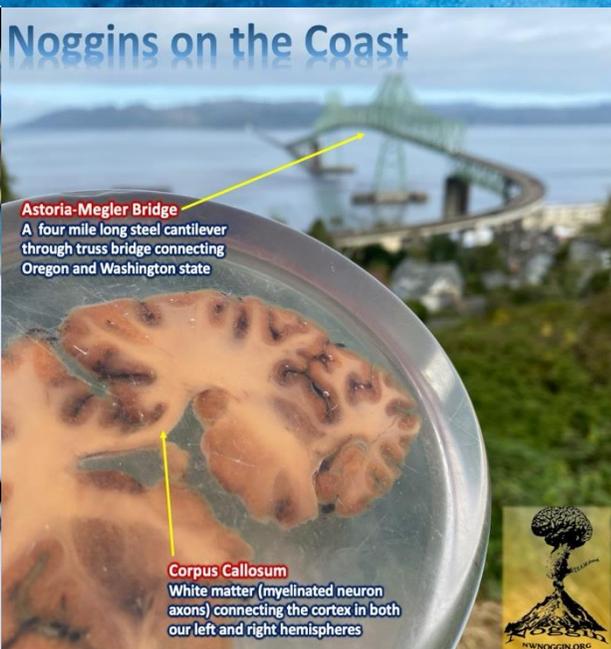
Meservy Meadows, OR  
Pop: ~40

Sisters, OR  
Pop: 3081

Heppner & Lone, OR  
Pop: 1240



**Youth get visual, hands-on experience with the brain**  
NW NoggIn, a neuroscience outreach nonprofit, reached out to youth at MacLaren Youth Correctional Facility this week to teach about brain development.



# LISTEN

-LIVED EXPERIENCES  
-RELEVANT KNOWLEDGE  
-SEEING OTHER PEOPLE



Heppner, OR



Knappa, OR

## HOMELESSNESS & THE BRAIN

Portland, OR  
Thurs, Oct 19th  
10am - 1pm



pearmentor gallery  
338 NW 6th Ave  
nwnoggin.org pearmentor.org

STREET KIDS  
ART  
NEURO-  
SCIENCE

## Noggins + NeuroChem visit Gaza



**Soma**  
Cell body – جسم الخلية

**Dendrite**  
Finger – أصابع  
Snakeskin – جلد الأفعى  
Ear – أذن

**Axon**  
Spine – محور عصبي  
Stem – جذع  
Rope – حبل

**Axon terminal**  
Roots – جذور  
Mouth – فم

#showusyourbraincell

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## DEE-NI NEURON

Siletz, OR

Do neuroanatomical terms have to derive from Latin and Greek?



**HII-NVST'E**  
Body

**K'WEE-DE**  
Tree needles

**CH'VTLH-K'VSH TIN'SH**  
Long, skinny lightning

**LE'-VN'**  
End of an object

**SOMA**  
Latin for body

**DENDRITES**  
Greek for tree branch

**AXON**  
Greek for axis, axis of the body

**AXON TERMINALS**  
Latin terminalis for boundary, or end

#showusyourbraincell

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# Why do we throw up?

New Post!

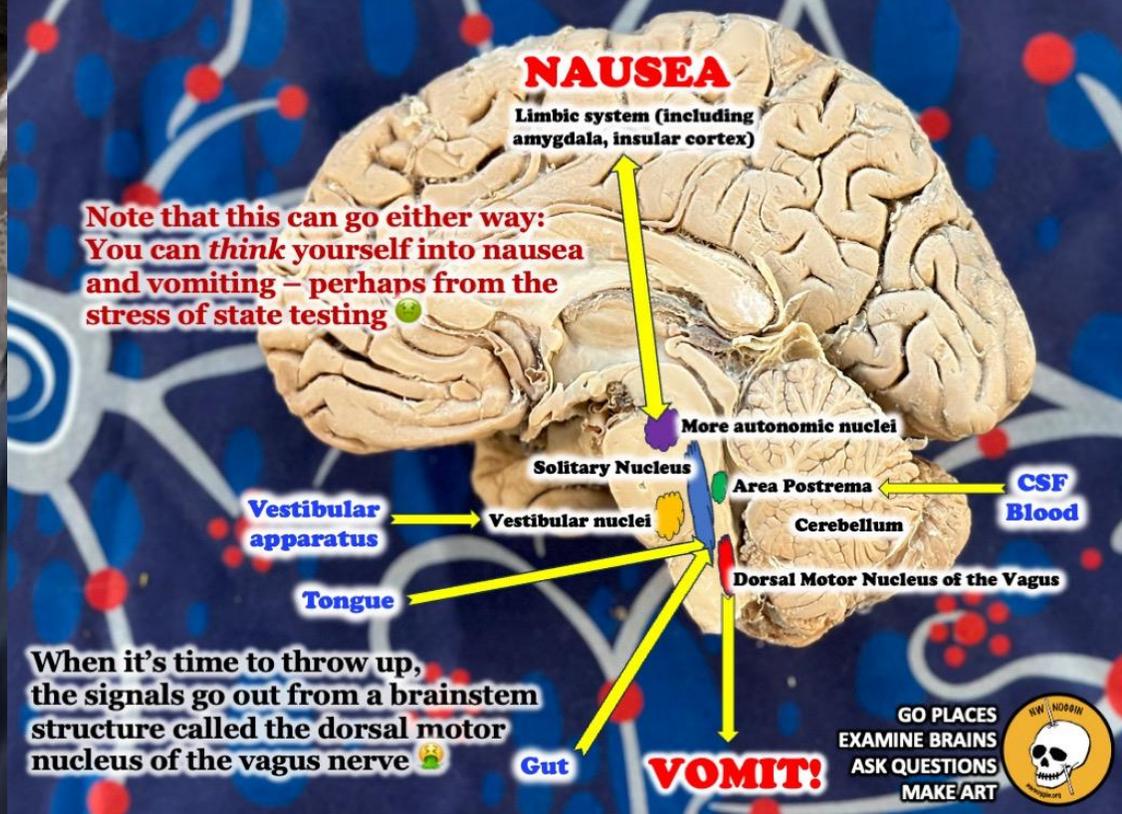
"I don't like testing, and sometimes it makes me throw up. Why do we throw up?" - Third grade student

Important questions from elementary school!



## Vomiting and Nausea in the Brain

The brainstem receives inputs from the gut (including the microbiome) and tongue in the solitary nucleus, the area postrema samples the blood and cerebrospinal fluid, the vestibular nuclei and cerebellum respond to signals from the vestibular apparatus, and additional autonomic nuclei further integrate this information and share it with higher limbic and cortical regions that generate feelings, including nausea...



When it's time to throw up, the signals go out from a brainstem structure called the dorsal motor nucleus of the vagus nerve

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# SHARE STORIES

- EMPOWER NEW VOICES
- BROADEN THE CONVERSATION
- MAKE PUBLIC INVESTMENT IN RESEARCH RELEVANT
- INVITE NEW PARTICIPANTS, PERSPECTIVES & **BRAINS**



***“The youth had an AMAZING time on Friday. They were beaming when we left and told me that’s the most fun they have had in a really long time. Thank you so much for providing such a rewarding outlet for them! 🌟” – Project Pooch***



**MacLaren Youth Correctional Facility**

**GO PLACES  
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Portland, OR



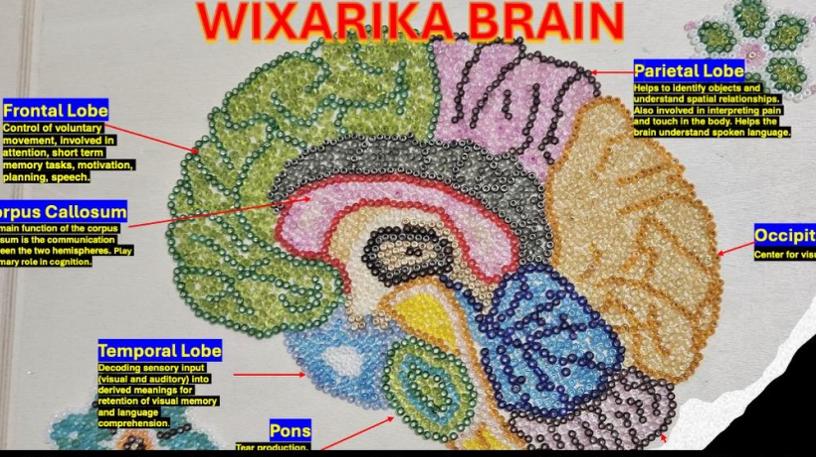
Astoria, OR

# MAKE ART

- ENGAGEMENT
- PERSONAL RELEVANCE
- SELF-AWARENESS AND **EMPATHY**



## WIXARIKA BRAIN



The diagram shows a cross-section of a human brain with various lobes and structures labeled with colorful Wixarika beadwork. The labels include:

- Frontal Lobe**: Control of voluntary movement, involved in attention, short term memory tasks, motivation, planning, speech.
- Corpus Callosum**: main function of the corpus callosum is the communication between the two hemispheres. Play primary role in cognition.
- Temporal Lobe**: Processing sensory input (visual and auditory) into derived meanings for retention of visual memory and language comprehension.
- Pons**: Air conduction.
- Parietal Lobe**: Helps to identify objects and understand spatial relationships. Also involved in interpreting pain and touch in the body. Helps the brain understand spoken language.
- Occipital**: Center for visual

*"Wixarika art is made by indigenous people from the states of Nayarit, Jalisco, and Sinaloa in Mexico. It consists of forming figures with 'chaquira' beads one by one, using bright colors. Among the multiple Wixarika designs are peyote cactus, which is a stimulant that indigenous people use in rituals. I decided to do a Wixarika brain so I could easily remember the lobes, and the internal parts of the brain. Additionally, I wanted to connect part of my culture with what I have learned in this wonderful class." — Cristina Gomez Aguilar, Portland State University*





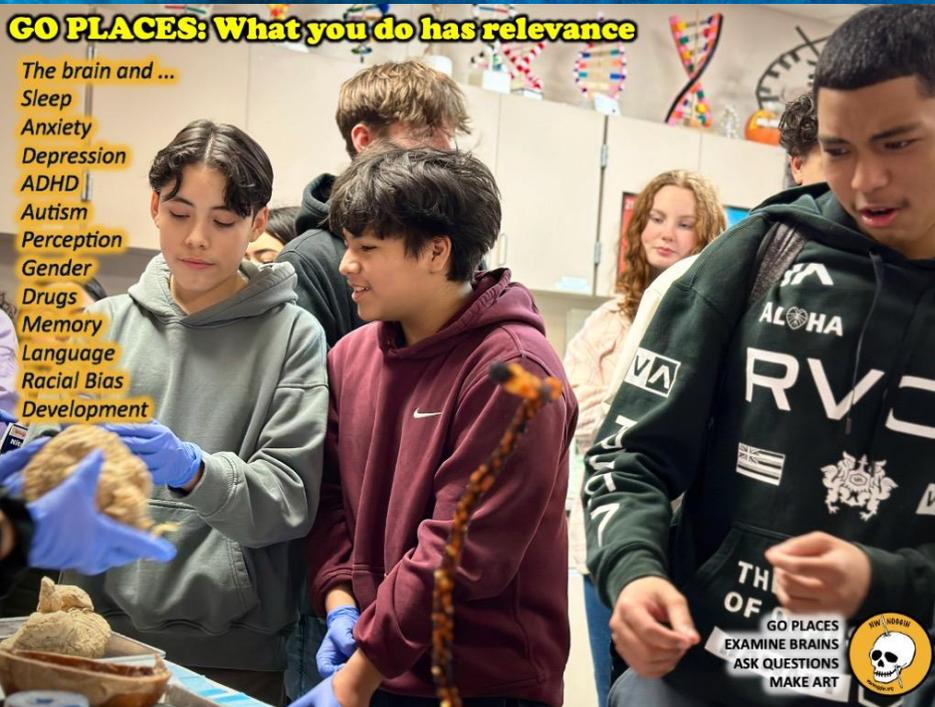
# INFORM POLICY

- RESEARCH TOPICS ARE POPULAR!
- INTERDISCIPLINARY/STEAM APPROACHES WORK
- 1. SCHOOL START TIMES FOR ADOLESCENTS
- 2. PERMANENT STANDARD TIME
- 3. ECONOMIC DEVELOPMENT



## GO PLACES: What you do has relevance

The brain and ...  
Sleep  
Anxiety  
Depression  
ADHD  
Autism  
Perception  
Gender  
Drugs  
Memory  
Language  
Racial Bias  
Development



## Healthy start times



### What is changing?

We are changing our schools' start times schedule next year based on learnings from our community feedback as well as the most current research about adolescent development. We plan to solidify our bell schedules and announce the official new times before the last day of school on June 20, 2023.



A group of diverse children and an adult woman are gathered around a table, looking at something off-camera with interest and excitement. The woman on the left has a wide, open-mouthed smile. The children, including a boy in a grey vest and a girl in a green hoodie, also show various expressions of curiosity and engagement. The background is a bright, indoor setting with other people and a blue wall.

# BRAIN RESEARCH IS COMPELLING

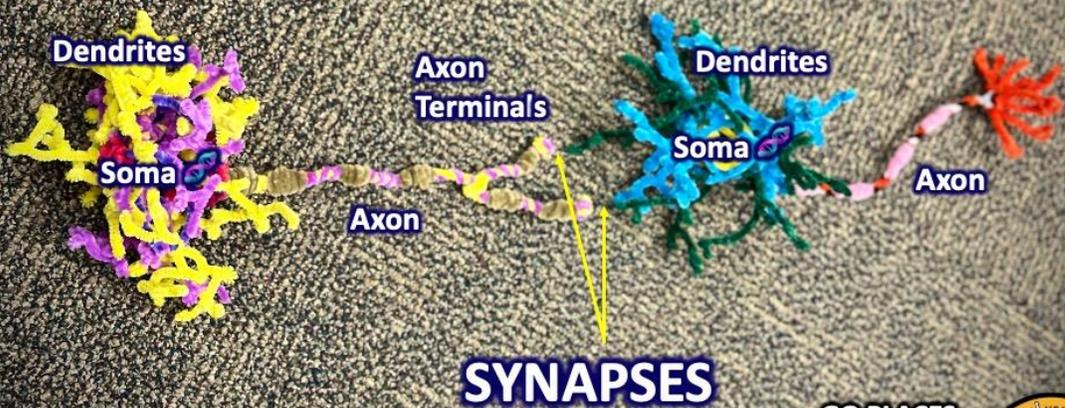
**\*PEOPLE ARE INTERESTED**

**\*THEY WANT TO HEAR ABOUT IT, AND BE INCLUDED**

# YOUR BRAIN IS UNIQUE

WE BEGIN WITH ~175 – 200 BILLION NEURONS  
END UP WITH 86 BILLION IN THE AVERAGE ADULT!  
FORMATION OF NETWORKS, BASED ON EXPERIENCE

## Neurons Connect



**100 TRILLION synapses!**

GO PLACES  
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Perceptions, Memories,  
Expectations, Habits,  
Biases, Schema,  
*Jumping to conclusions*

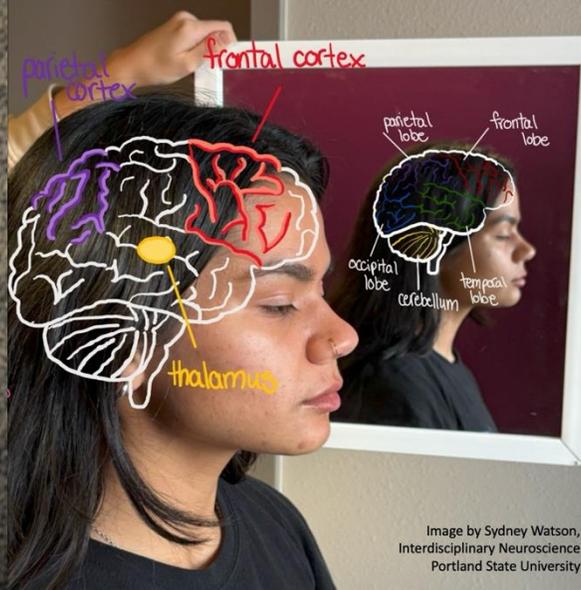
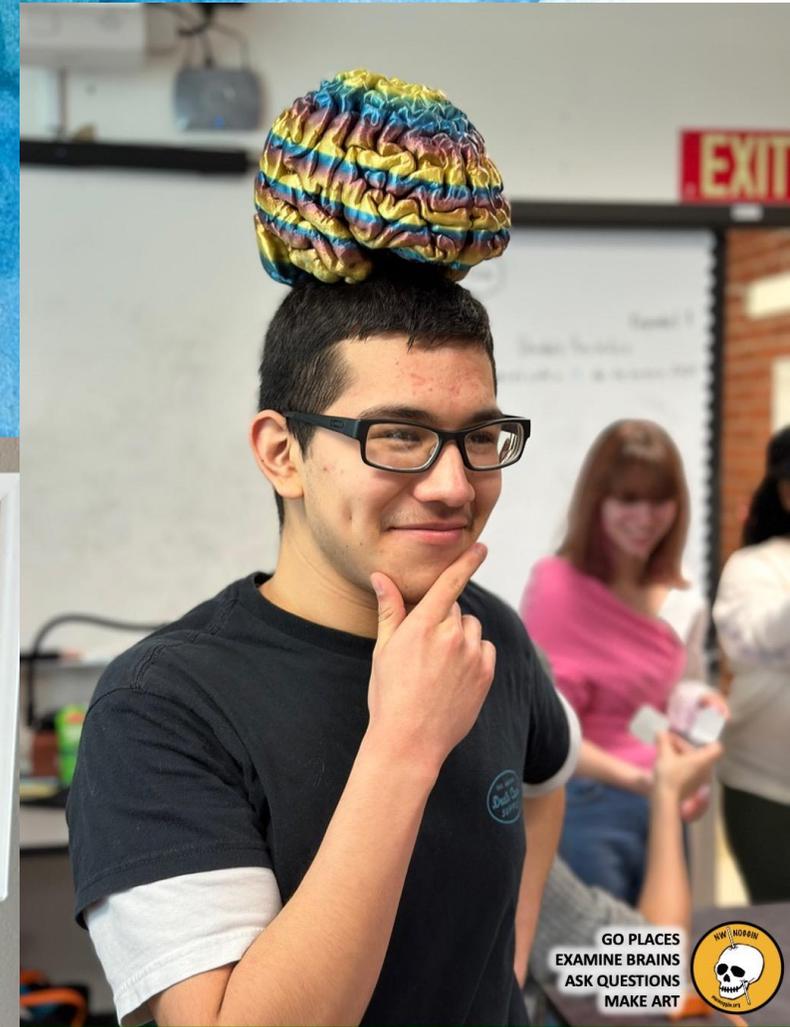


Image by Sydney Watson,  
Interdisciplinary Neuroscience  
Portland State University



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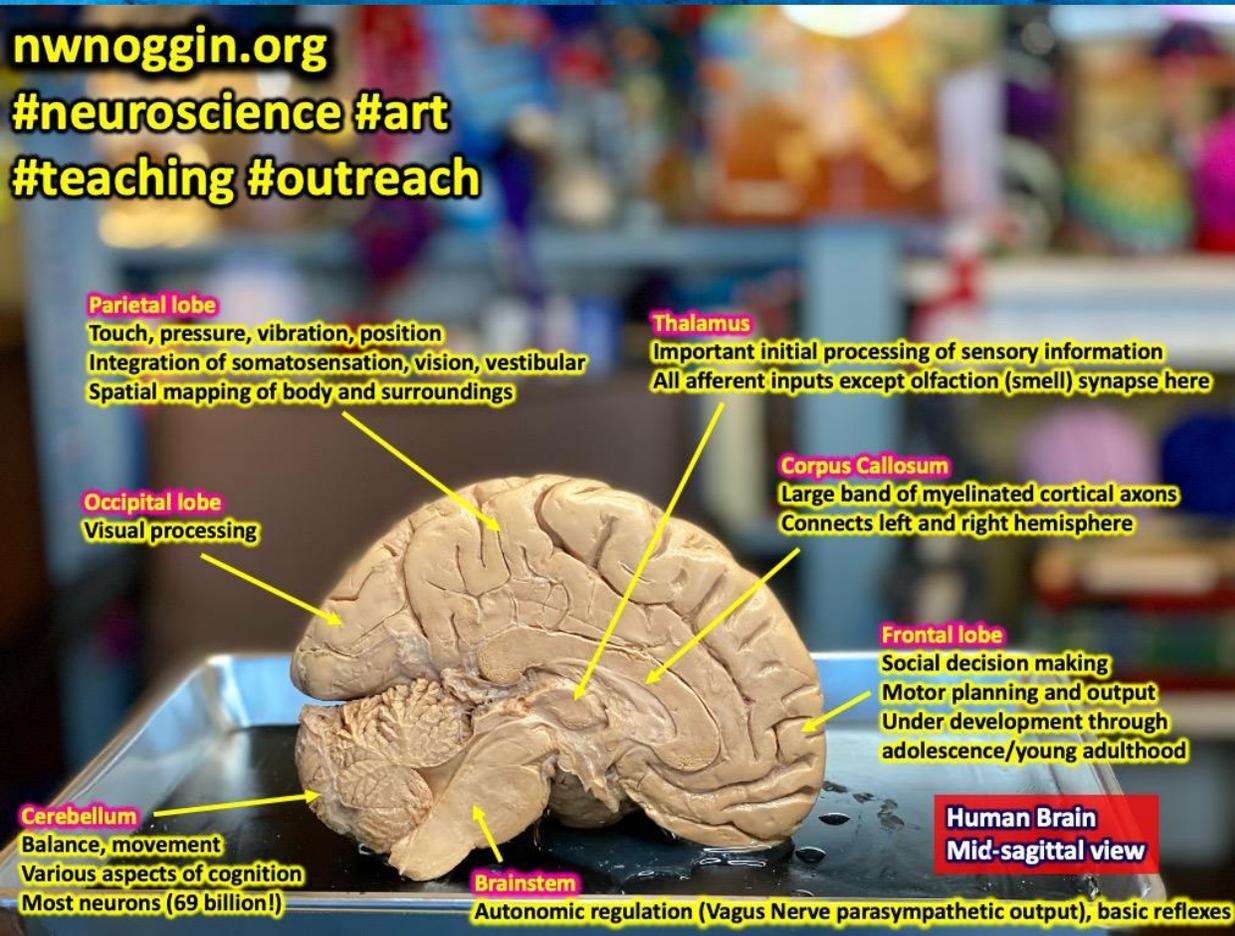
# BRAINS DEVELOP

*How are you perceived?  
What experiences shape you?  
What opportunities do you have?  
What are the social rules for you?*

**ADULT BRAINS BECOME MORE FIXED: NETWORK IN HABITS AND BIASES  
YOUNG BRAINS ARE MORE PLASTIC, CHANGEABLE, AND RESPOND TO NOW**

**nwnoggin.org**  
**#neuroscience #art**  
**#teaching #outreach**

***And the world always changes***  
**We need brains that are changing TODAY**



**Future scientists, artists,  
doctors, researchers,...!** ❤️



**Teaching Matters** ❤️



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# ENRICHMENT MATTERS

MARIAN DIAMOND RESEARCH

More enrichment, more pathways, more possibility,...







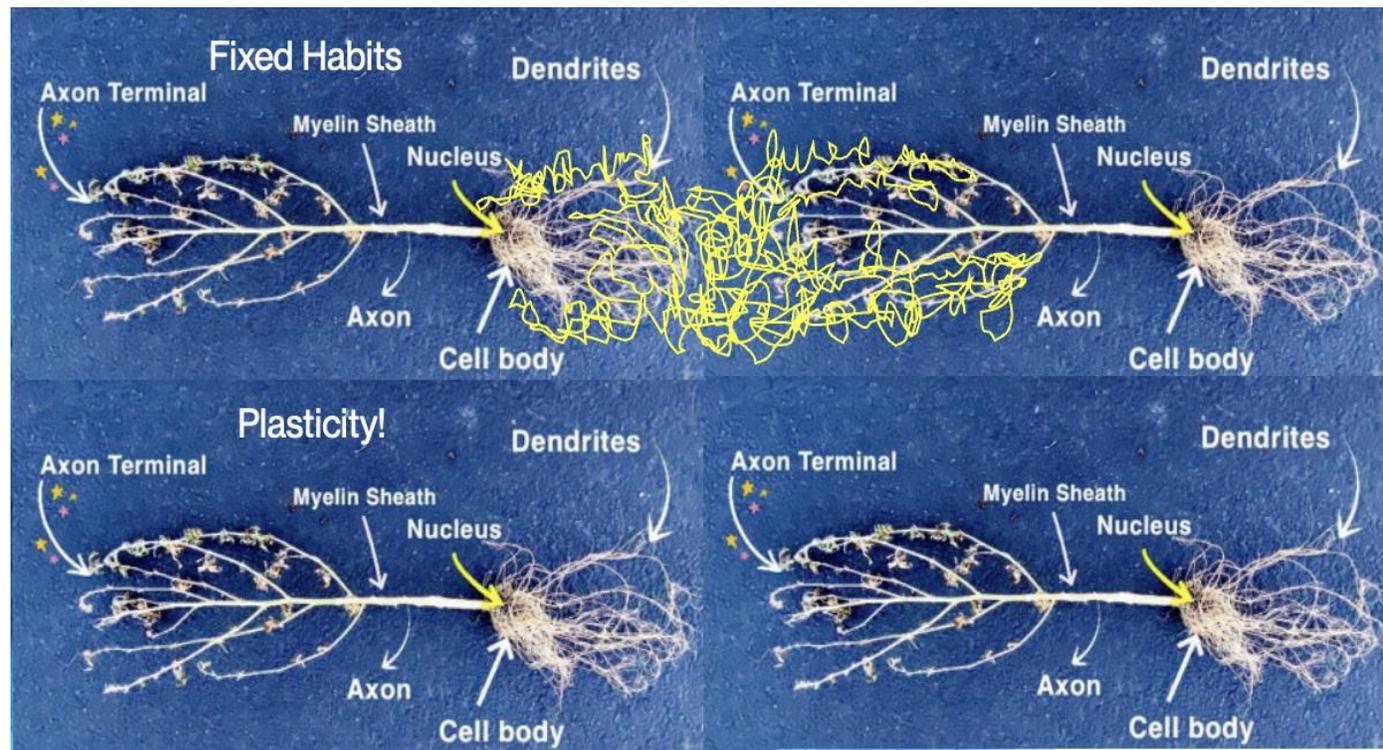
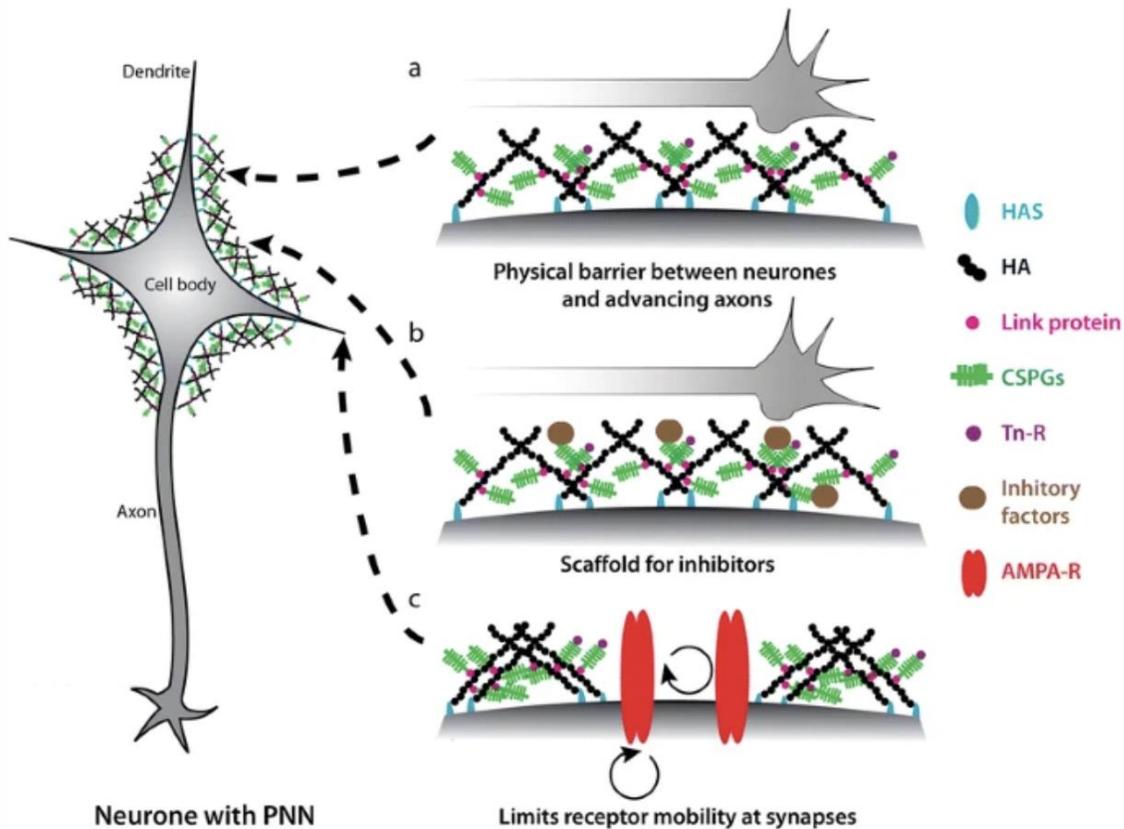
if the human brain is so "complex" and "smart" why are some people so s+upid?



# PLASTICITY IS POSSIBLE

ADULT BRAINS CAN CHANGE!  
FIXED NETWORKS REQUIRE LESS ENERGY TO MAINTAIN AS IS  
PLASTICITY (CHANGE) TAKES ENERGY, EFFORT AND GROWTH

*The perineuronal net and the control of CNS plasticity,*  
Difei Wang & James Fawcett, Cell & Tissue Research (2012)



# SO HOW DO WE ENGAGE DEVELOPING BRAINS?

*If you're motivated, intrigued, curious, engaged, your brain is more plastic.*

CHANGE YOUR ENVIRONMENT: GO PLACES  
WELCOME NEW BRAINS, FROM MORE BACKGROUNDS  
LISTEN TO WHAT YOUNG PEOPLE HAVE TO SAY  
PROVIDE RESOURCES AND ENRICHMENT  
PROMOTE ADULT PLASTICITY  
MAKE ART



# SYDNEY WATSON

INTERDISCIPLINARY NEUROSCIENCE, PORTLAND STATE

[To Bounce Or Not To Bounce](#)



"Thanks again everyone. As always this was a wonderful experience. The students from past years were crazy excited when they found out you were in the building. You have a lasting impact."

- Kevin Marquardt, Science Teacher, Portland Public Schools

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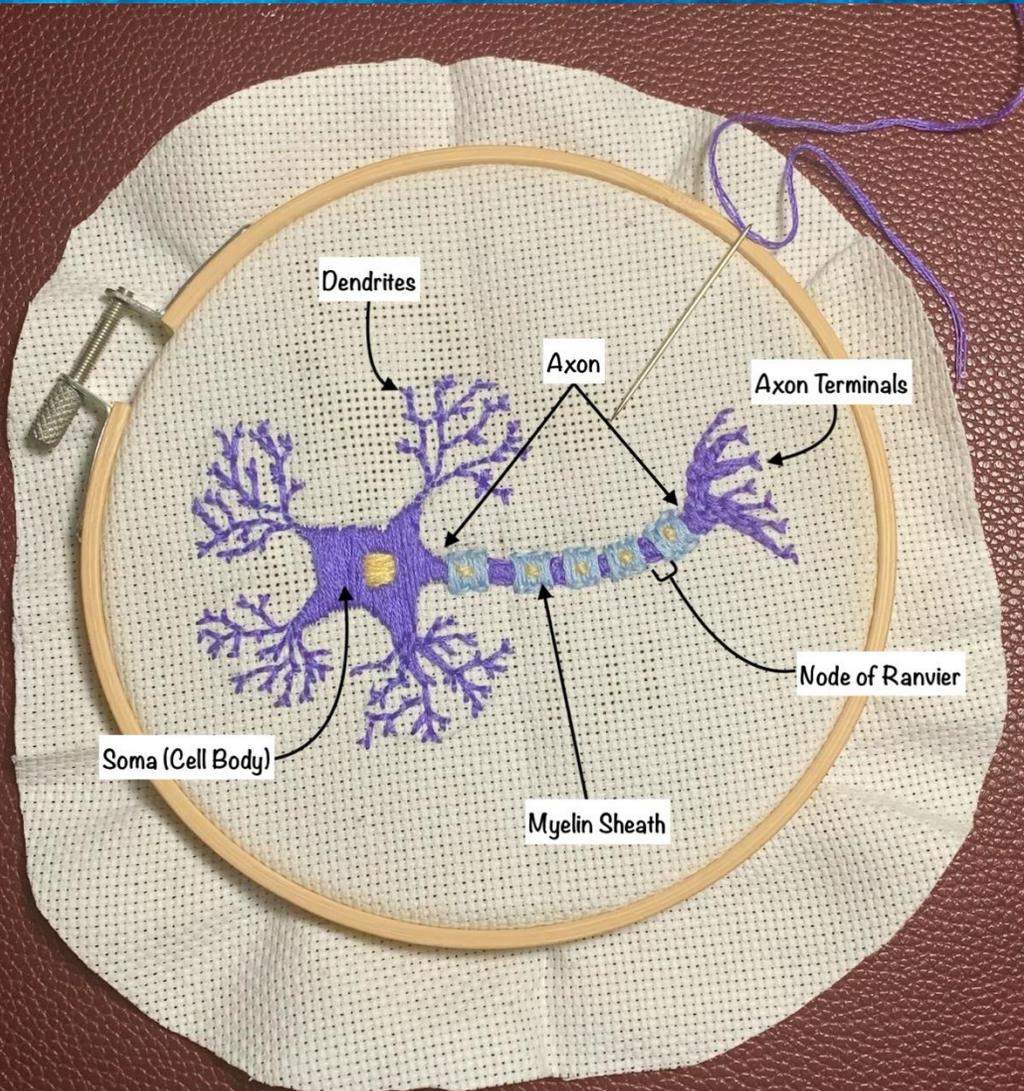
# WILLOW COUGHLAN

INTERDISCIPLINARY NEUROSCIENCE, PORTLAND STATE

[Is There Room Enough?](#)

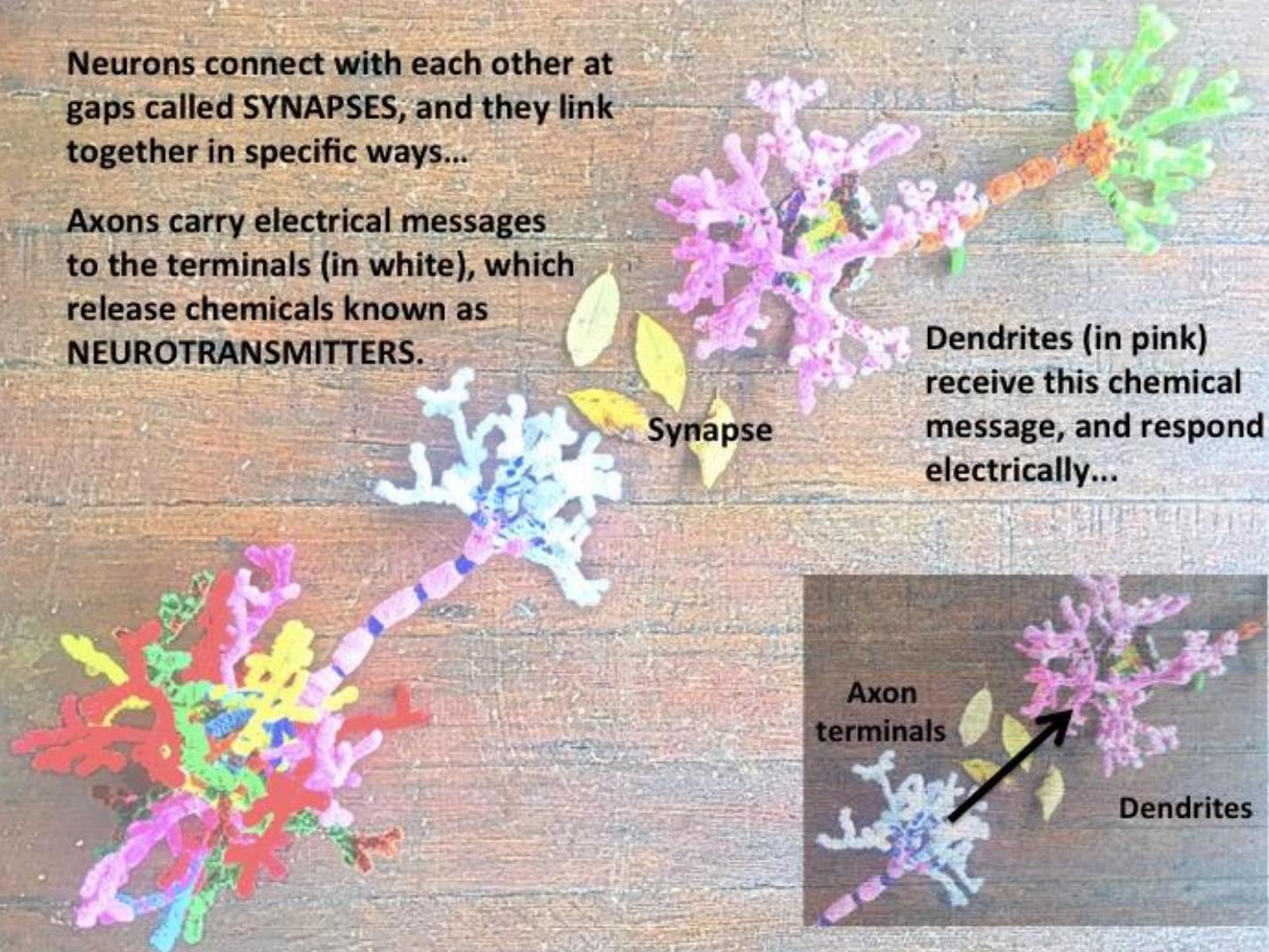


# LET'S MAKE SOMETHING!



Neurons connect with each other at gaps called **SYNAPSES**, and they link together in specific ways...

Axons carry electrical messages to the terminals (in white), which release chemicals known as **NEUROTRANSMITTERS**.



**nwnoggin.org**

**#neuroscience #art #research  
#teaching #scicomm #outreach**

The Souls of Millions of Light-Years Away (2003)  
Yayoi Kusama, Infinity Mirrored Room, The Broad

**Frontal lobe**

Social decision making  
Motor planning and output  
Under development through  
adolescence/young adulthood

**Human Brain  
Lateral view**

**Parietal lobe**

Touch, pressure, vibration, position  
Integration of somatosensation, vision, vestibular  
Spatial mapping of body and surroundings

**Occipital lobe**

Visual processing

**Temporal lobe**

Object recognition  
Language comprehension,  
Declarative/explicit memory  
Audition (hearing))

**Cerebellum**

Balance, movement  
Various aspects of cognition  
Most neurons (69 billion!)

**AMYGDALA**  
(deep in temporal lobe)

Sulcus  
"Valley"

Gyrus ("Circle"; ridge or fold of cortex)

