
Franklin
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www.nwnoggin.org
COLLABORATIVE ART AND NEUROSCIENCE OUTREACH IN PORTLAND AND VANCOUVER

NW Noggin

Science, art - and inspiration

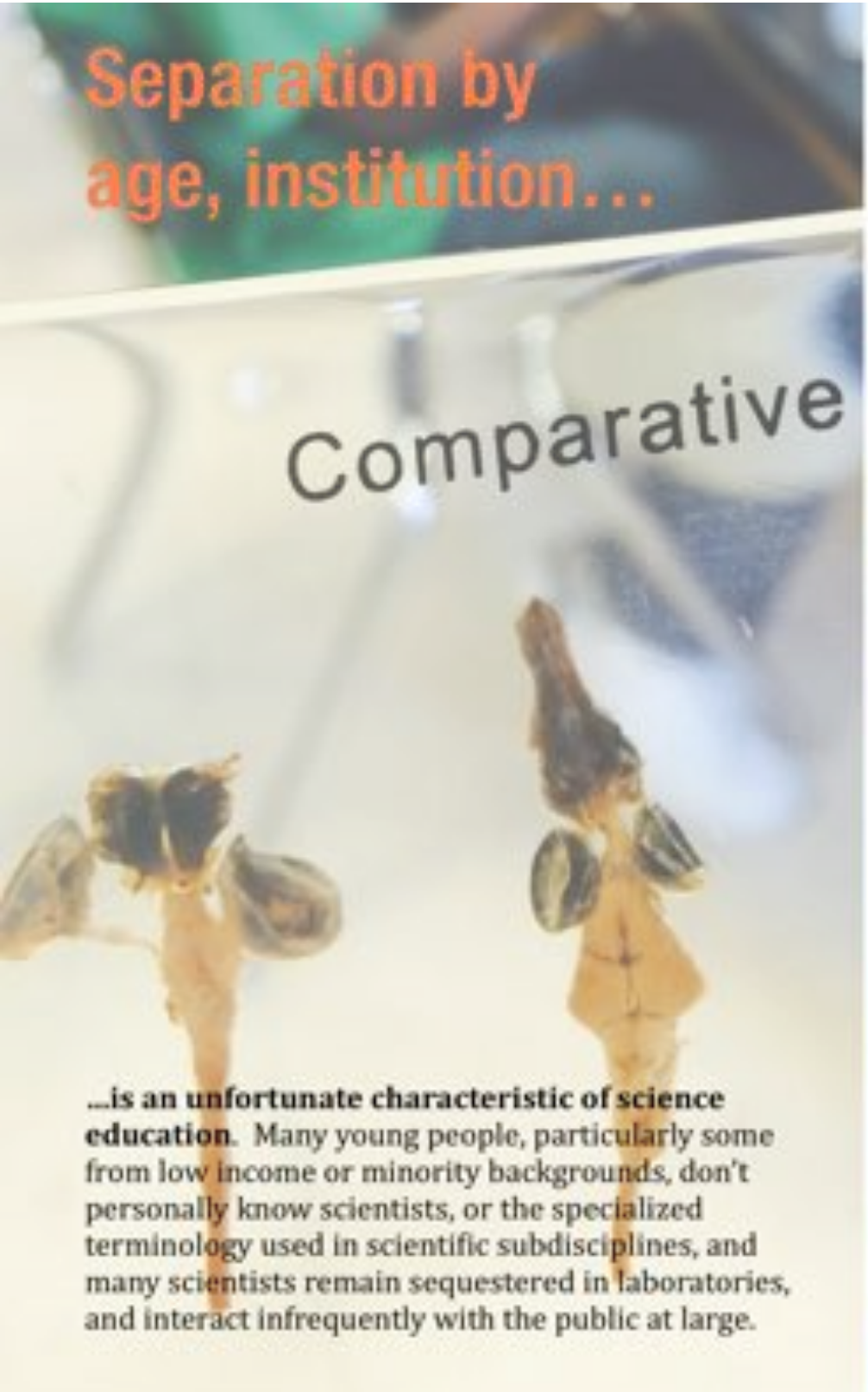
Vigorous, creative scientific investigation improves our understanding of how things work, effectively addresses pressing problems, and benefits people around the globe. The best scientists conduct replicable, evidence-based studies, train young investigators, and successfully convey knowledge of their efforts, fostering public understanding and support for further funded research. Ideally they inspire people to explore the fascinating structure/function relationships that underlie our world.

Gathering community talent

TO TEACH THE NEXT GENERATION

Training new scientists is key to continued advancement in scientific knowledge, but our current system of STEM (Science, Technology, Engineering, Mathematics) education is still lacking in several respects…

Separation by age, institution…



…is an unfortunate characteristic of science education. Many young people, particularly some from low income or minority backgrounds, don't personally know scientists, or the specialized terminology used in scientific subdisciplines, and many scientists remain sequestered in laboratories, and interact infrequently with the public at large.

The solution? Bringing graduates, undergraduates and K-12 together…

Undergraduates enthused about science are often curious about graduate school, but are unclear about what that involves, or what specific funded research is underway at area institutions. And graduate students are typically immersed in a rarefied, isolated environment, and thus exciting, cutting edge research does not always reach and inspire a broader audience…

Science and art…

From STEM to STEAM…

NW Noggin (Northwest Neuroscience Outreach Group: Growing in Networks, www.nwnoggin.org) is a vigorous, creative, unique, and thus far largely volunteer effort to bring scientists and students of all ages together to share their expertise, enthuse young people about science, leverage area educational resources, and inform and excite the public about ongoing, taxpayer supported research.

Essential to our training of new scientists is the inclusion of art (the "STEAM" approach). Arts integration makes learning personally relevant. It allows open ended exploration of scientific concepts, and offers science teachers a broader palette from which they can differentiate their lessons. This cross-disciplinary collaboration is also valuable to artists, who often use their skills to explore and enhance work in other fields. Yet art students are seldom exposed to this kind of collaboration during their education.

Outreach works…

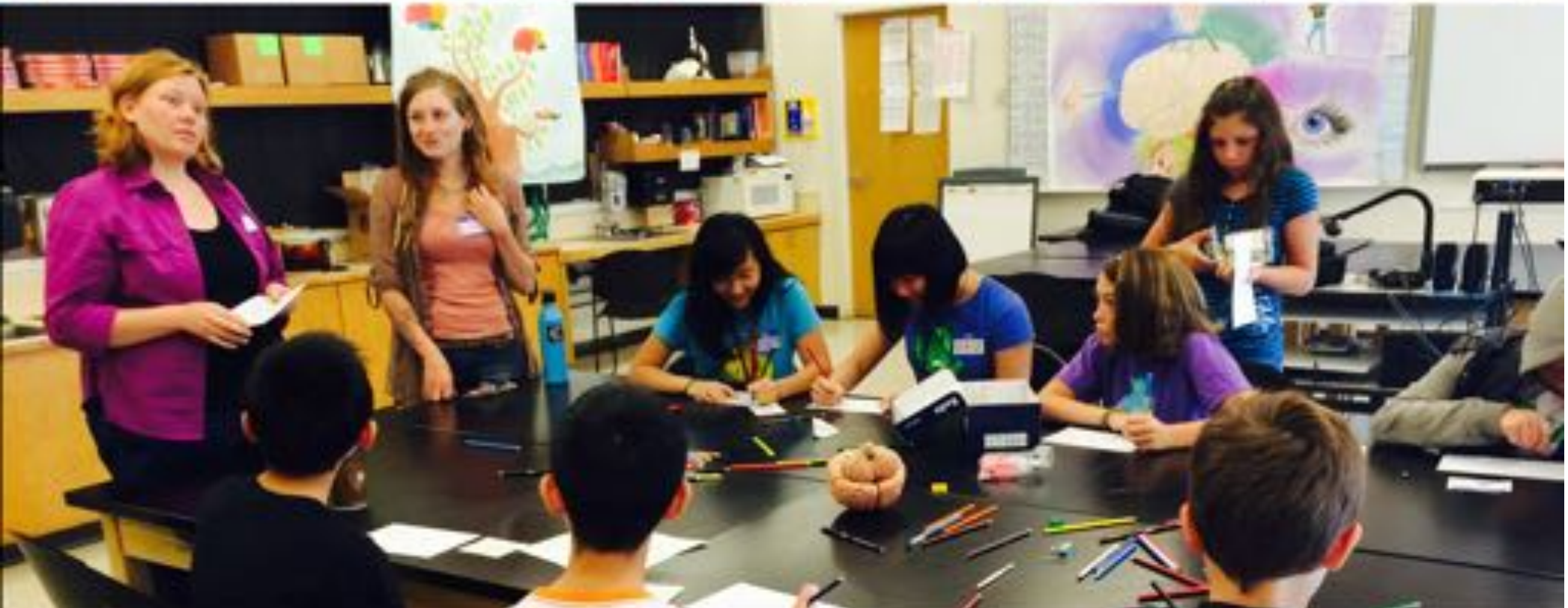
From 2012 to 2014…

…we have enlisted graduates and undergraduates in neuroscience and psychology from public universities in Oregon and Washington (Oregon Health & Science University (OHSU), Washington State University in Vancouver (WSUV) and Portland State University (PSU)), who have worked with art students from the Pacific Northwest College of Art (PNCA) to develop and deliver sustained, multi-disciplinary instruction about the brain to hundreds of middle and high school students in the Portland Public Schools (PPS).

FIRST: Graduates and undergraduates work together…

Advanced classes at PSU, WSUV…

We start by integrating graduate students into advanced undergraduate neuroscience courses during the academic year. The undergraduates learn about neurons, networks, and techniques, pore over journal articles, and gain fluency in the language of the discipline, before engaging directly with graduate students, who each spend a month teaching about their work. This informs our undergraduates about funded research opportunities, and helps train our graduate students to teach.



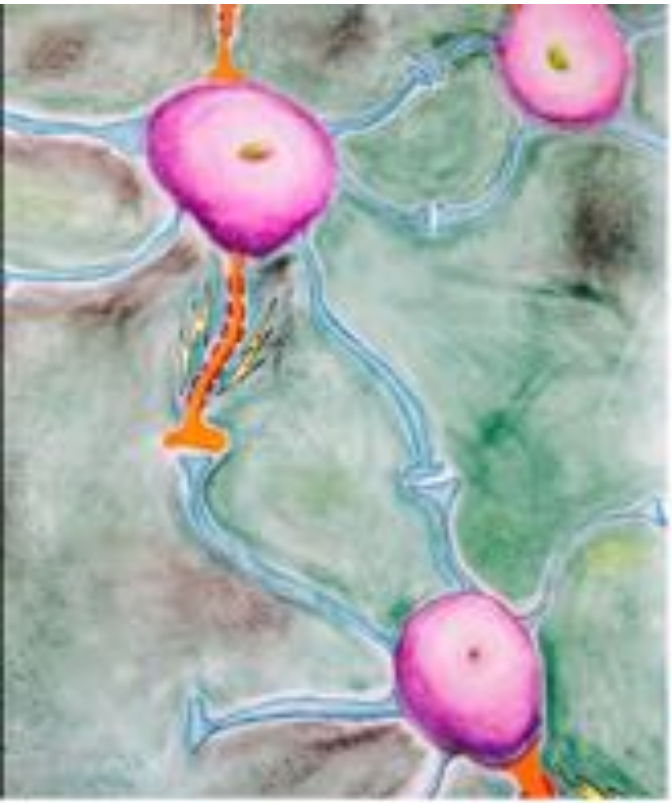
NEXT: We bring everyone together in summer…

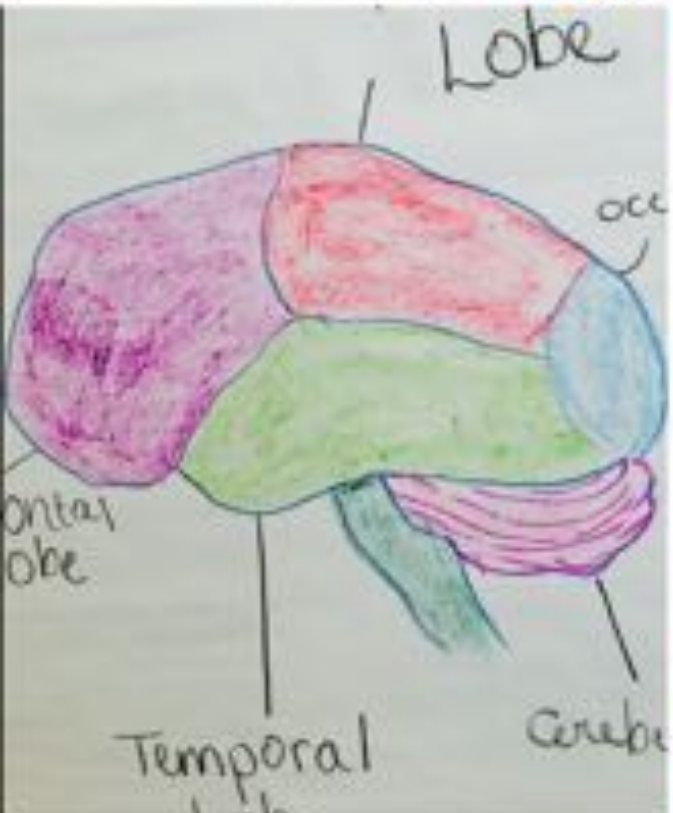
…along with our art students…

…to develop their own, collaborative, creative, multi-week courses for K-12 students enrolled in city, county, state and federal programs designed to offer academic enrichment opportunities.

In Summer, 2014…

Thirty five students from four universities (WSUV, PSU, OHSU, PNCA), in two states, educated 220 "academic priority" students in five PPS schools (Sabin, Jason Lee & Harrison Park K-8s, and Madison & Franklin high schools), enthusing them about studying the biology of their own developing brains.




Lobe
Temporal

Measurable Progress…

Data collected over the past two years indicates that our work improved student attitudes towards science, and progress in meeting new federal Next Generation Science Standards.


Hello

Group activities

Art projects always complement short lectures on how the brain works…

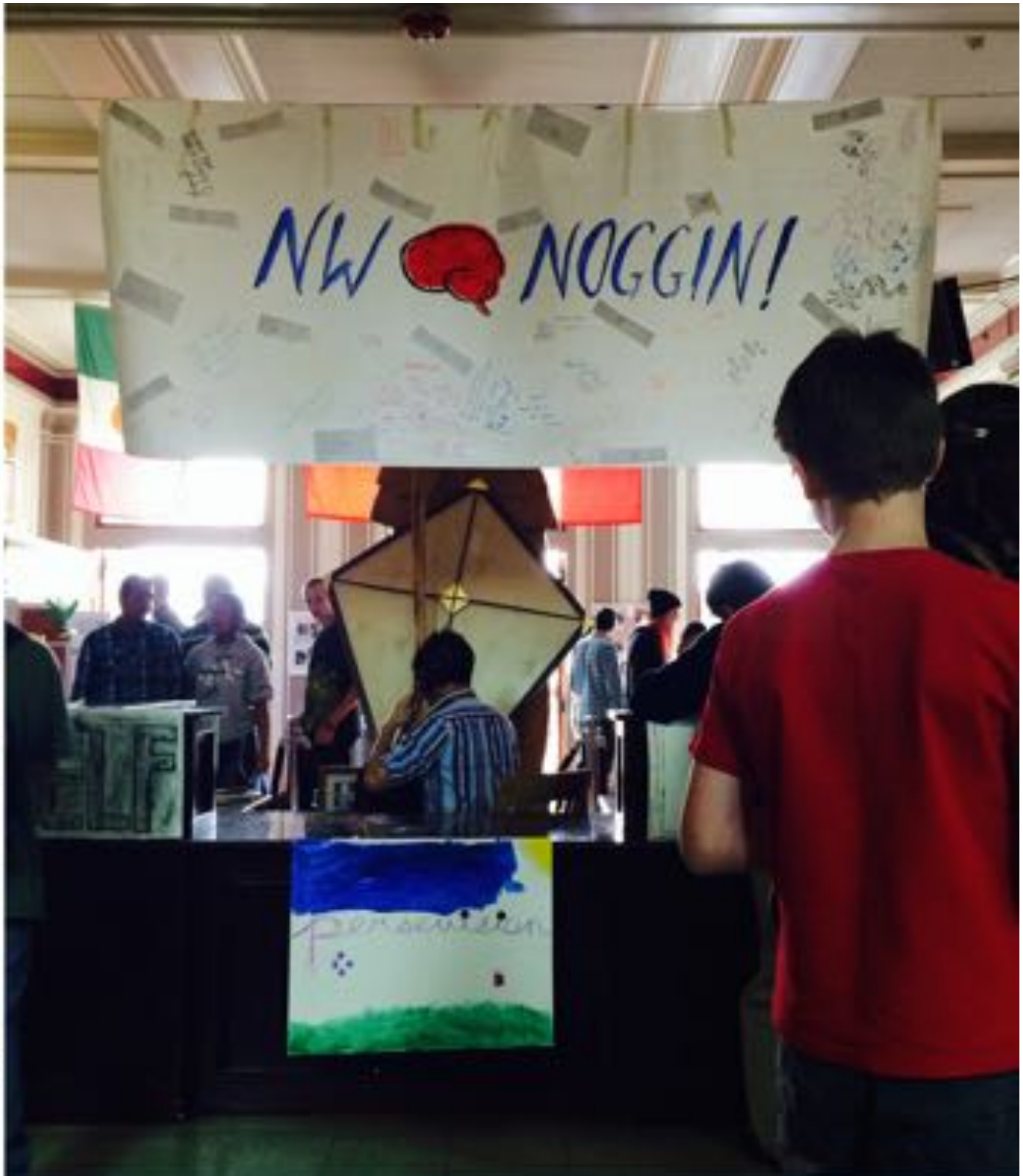
High school outreach in PPS: Madison and Franklin

NW Noggin partnered with the Multnomah County "Schools Uniting Neighborhoods" (SUN) program, and also with a federal grant program called GEAR UP, which helps academic priority students reach college.

Our volunteers collaborated directly with high school science teachers, and taught more than 170 entering freshmen, who earned valuable high school credit for their summer work..!


at did we
learn?


Using the MindFlex with Noggin!


NW NOGGIN!

Links to local resources

Our Noggin high school students visited the Oregon National Primate Research Center (ONPRC) in Beaverton, one of eight primate research centers in the United States....

Diana Gordon, the ONPRC Outreach Director, expertly walked them through the process of therapeutic drug development, from an idea, to literature searches, funding efforts, and testing in animal models....

After touring the facility, home to 5000 macaques, Noggin students met directly with research scientists, and learned about current work on multiple sclerosis, infertility, and the development of improved brain imaging techniques....

Discovering what's actually being done, and how to get involved through further education and study, is a tremendous, eye-opening benefit of the collaborative MM Noggin approach.


OREGON REGIONAL
PRIMATE RESEARCH CENTER






Middle schools

We also served smaller classes (about 50 students in all) in three additional PPS K-8s. At Sabin, Harrison Park & Jason Lee, 5th through 8th graders learned about neurons and networks, too!

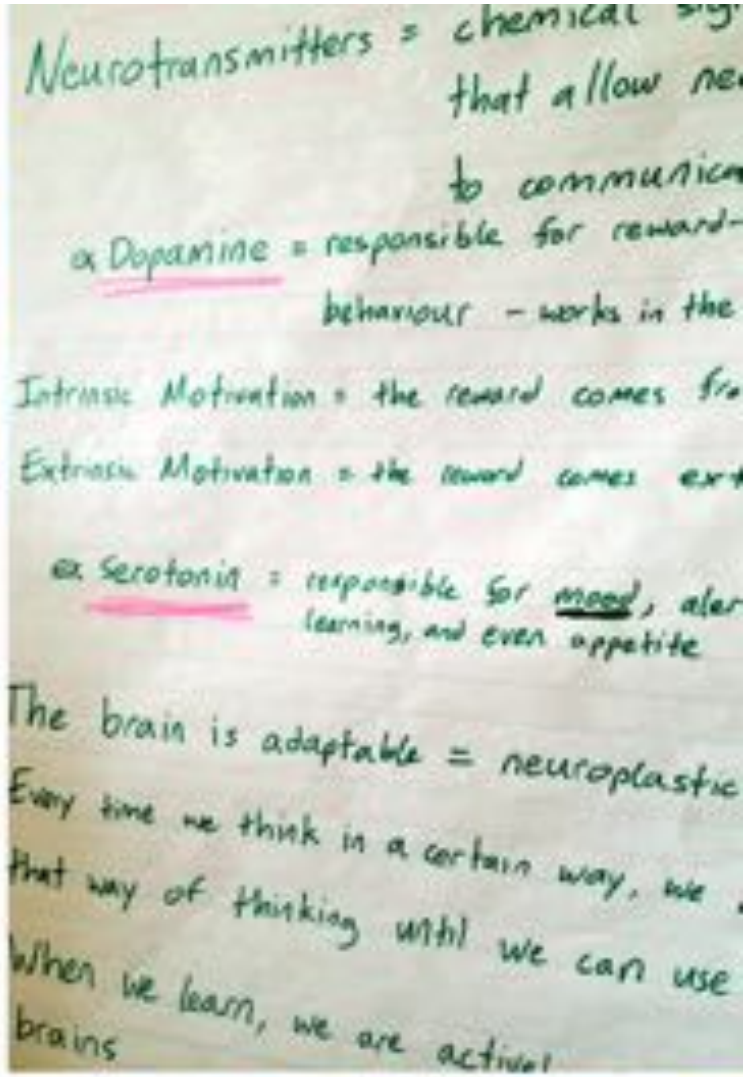
We partnered with the SUN program to run these courses, and our NW Noggin participants taught entirely by themselves…

Middle schoolers visited laboratories at OHSU, to learn more about how scientific research is carried out.

NW Noggin, by virtue of these multiple partnerships, offers participating graduates and undergraduates a choice of educational environments in which to develop their teaching skills….

Leveraging expertise…

Our graduate students bring a wealth of specialized knowledge and skills to their classrooms. One 2014 participant, Morgan Wirthlin, is an expert on avian language development, and brought his songbirds to class at Harrison Park :)



Neurotransmitters = chemical sig
that allow ne
to communica
ex Dopamine = responsible for reward-
behaviour - works in the
Intrinsic Motivation = the reward comes fro
Extrinsic Motivation = the reward comes ext
ex Serotonin = responsible for mood, aler
learning, and even appetite
The brain is adaptable = neuroplastic
Every time we think in a certain way, we
that way of thinking until we can use
When we learn, we are activel
brains

Motivated behavior…

Learning is fun! All of our students become expert at recognizing important components of human brains, from lobes to subcortical structures - and they have the chance to dissect sheep cerebrums with assistance from Noggin volunteers…









Community engagement

Our participants are empowered by their experience, and gain confidence in their ability to creatively and effectively communicate complex concepts in neuroscience...

NW Noggin has also created a popular local lecture series (at Velo Cult, www.velocult.com, a Portland bike shop/ pub/event space), where science graduates now collaborate with art students to present their research, furthering public education and outreach.

NEXT STEPS...

We seek to expand this effective, multi-disciplinary, multi-institutional, multi-generational approach to teaching science and art to more schools in our area, and we'd like to offer our volunteer participants access to science conferences, to discuss their efforts, and learn how scientific discovery is shared.

We also seek to add an international component to NW Noggin. Science and art are global endeavors, and forging links with those in other cultures furthers collaboration, outreach, and creative approaches to educating a new generation of researchers, and artists.

Specifically, we would like to build on existing links with the Centro Interdisciplinario de Neurociencia at Universidad de Valparaiso, Chile, home to a renowned graduate program in neuroscience, and with outstanding artists and arts programs in this vibrant South American city.

Many thanks

None of this would happen without community support… :)

NW Noggin efforts are funded in part by…
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http://www.ohsu.edu/xd/research/centers-institutes/portland-alcohol-research-center/index.cfm
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http://cas.vancouver.wsu.edu/neuroscience
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GEAR UP College Ahead Program (CAP) grant
http://www.pps.k12.or.us/schools/gearup-cap/
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Neuroscience and Art

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