

We have five GEAR UP funded participants (Angela Gonzalez, Nathan Allen and Courtney Miskell from WSU Vancouver, Carrie Miyamoto from PNCA, and Gaile Parker from PSU), and two Portland Alcohol Research Center funded folks (Sam Carpenter and Binyam Nardos from OHSU).

They'll work with 150 juniors at Skyview High School in Vancouver, Washington!

Skyview High School, 1300 NW 139th St, Vancouver, WA 98685
<http://skyview.vansd.org>

The dates/times for the program are...

TUESDAY, MAY 24, 7:30am – 2:45pm

WEDNESDAY, MAY 25, 7:30am – 2:45pm

THURSDAY, MAY 26, 7:30am – 2:45pm

FRIDAY, MAY 27, 7:30am – 2:45pm

About 25 students at a time, for multiple periods throughout the school day.

Tuesday through Thursday we'll introduce topics (e.g., neurons, networks, brain areas, imaging techniques, relation of brain to behavior..?), art projects, and get students involved in learning neuroscience.

On Friday we'll split into three groups for field trips by bus: 50 students will head to the National Primate Research Center, 50 to the Yes! Program imaging labs at OHSU, and 50 to the Portland Art Museum!

Notes from past events at Skyview

Day 1: A Synapse Sunrise at Skyview High

- introduction to the cerebrum, discussion of neurons and synapses, drug actions and effects, and large scale networks that carry out decision making, internal reflection, memory, and attention...
- sheep brains for our students to dissect.
- asked students what they already knew.
- This led to lively discussions about how we use only 10% of our brains (myth!), how each brain hemisphere controls movements on the opposite side of the body (true!), how you lose (and sometimes gain!) neurons throughout your life (true!), and other topics...
- asking students to act out the functions associated with various brain lobes. This game of brain charades led to some creative performance, and enthusiastic guesswork...
- Jeff Leake orchestrated an art project related to illustrating those cortical lobes and their functional associations...
- examine brains up close, and ask questions
- a short video ("The Unfixed Brain") to introduce what the human brain looks and feels like before it is immersed in formalin and "fixed" for preservation(softer, and more vulnerable)...

Day 2: Neurons

- overview of the neuron.
- development : By the time we reach adulthood, we're typically down to half that number, but the 100 billion cells that remain make more useful links
- explaining the structure and function of the branch-like dendrites, the neuron cell bodies, and the cell nuclei, axons, axon terminals and myelin sheaths
- build pipe cleaner neurons
- effect of timely exposure to environmental variables on dendritic spine formation/elaboration
- Marian Diamond's research leading to the establishment of the federal Head Start program, to offer children the chance to increase brain connectivity during critical developmental periods...

Day Three : Neurotransmitters and Drugs

- Presynaptic/postsynaptic neurons, action potentials, synaptic connections and neurotransmitters, axon terminals, vesicles, receptors, post-synaptic membranes, etc...
- Drugs, which are themselves chemicals, often act at synapses to disrupt the normal flow of information. Some drugs empty or prevent the transport of neurotransmitters into membrane-bound storage sacks called vesicles (3), or activate or inhibit the reception of chemical information by large, membrane-embedded proteins known as receptors (5)...
- Mouse party
- Jeff Leake introduced everyone to some basic skills involved in working with clay, and how to form an impressive miniature brain
- Dopamine release results in motivated behaviors, and we discussed how involved it is in healthy motivations
- One serious concern with drug use in adolescents is how decision making networks in the rapidly developing frontal lobes will rewire in response to drug-induced dopamine activity, generating an unusually strong and impulsive drive towards stimuli associated with drug seeking, and drug taking, instead of healthier pursuits...
- Chronic drug use also changes the structure of critical dopamine synapses, leading to less overall response in dopamine brain networks that are essential for experiencing all motivation, and drive

Moving forward – Skyview 2016

Total number of participants:

Grouping of participants, do all participants attend the same class of 25 students at the same time?

Meetings before Monday 5/24