

# Mind Games

STUDENTS TEACH THE ABCs OF NEUROSCIENCE



A clutch of nine students is gathered around a blacktopped table in the basement of the Solomon Psychology Lab. A laptop, aglow with the outline of a lesson plan, is at the center of their brainstorming. It's the weekly planning session for the ABCs of Neuroscience, and the class is preparing a lesson on memory

some of them will teach at the Sayre School just west of campus. Words and ideas, those bumptious brainchildren, bounce around the room from brain to brain – coruscating across neurons, leaping synapses, changing minds. The class has to explain how the brain stores and retrieves information, but they need to do it in a way that ninth-graders can wrap their minds around.

"We'll stage a kidnapping in front of the class," Tyler Wallen strategizes. "It'll demonstrate how the memories of eye witnesses aren't always reliable."

"The kids might interpret the skit as carte blanche for free time," someone cautions. The students are groping for the ideal mix of science and fun – fun with a lid on it.

Steve Fluharty, C'79, Gr'81, a veterinary school professor, is at the table too, scribbling notes. "You should think about time management," he offers. "Each demonstration will take about five minutes, right?" Fluharty directs the School's biological basis of behavior program, the multidisciplinary major that most of these students have declared. Now and then he throws in a heads-up on something

they might have missed, and sometimes he seizes the opportunity to give a neuroscience mini-lecture. Mostly, though, he's a hands-off teacher, leaving room for his students to devise their own lesson plans for interactive, hands-on activities that will teach high schoolers how the brain works.

Each Thursday, after a Tuesday strategy session, the Penn students hop vans into West Philly with plans and props and attention-grabbing activities about some aspect of brain function. Topics include neurons, taste and smell, learning, depression and addiction. This week's class is on hunger and obesity.

The Sayre kids wear black and white uniforms. Some are slumped in chairs, but most are chattering. A banner above the blackboard in front of the classroom reads, Wanted: Inquiring Minds. Heaped on a table at the back are white buckets, plastic funnels, toilet paper rolls wrapped in duct tape and strings of lights that together made a room-size neuron in an earlier lesson.

"What is hunger?" Clara Lee begins. "What happens?"

"Your stomach growls and your mouth waters," a ninth-grader responds.

"And how do you know when you're full?"

To demonstrate how the brain knows when to stop eating, they build a "human pathway model." The Penn students marshal a group of kids into a line, each one representing a part in the interlinked brain-nutrition signal system. A picture poster of a brain or small intestine or other organ hangs on

each member along the pathway. Other students gather crumpled newspaper to stand in as food. "Is that dessert?" one of the kids cracks. Balls of paper get passed through the mouth and down the line to Giselle Kohler, the stomach, who stands in a bulging garbage bag.

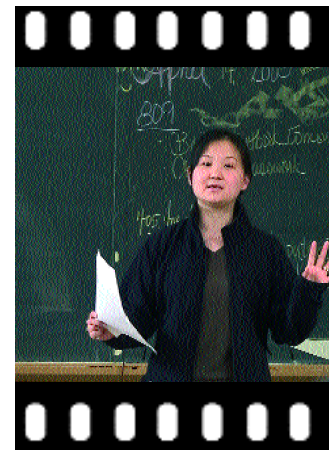
Amid the turbulence and the talking out of turn, the Penn students doggedly translate the behaviors and sensations of eating into brain science. This fall, the ninth-graders will put their new knowledge to work when they help build interactive learning stations for third- and fourth-graders for a Kid's Judge! Neuroscience Fair on Penn's campus. The Sayre students seem to be picking up the terms and ideas left behind by their ABC instructors.

Penn student Rushil Rao reports that during one lesson, some "class clowns mentioned a neurotransmitter uptake mechanism that had been introduced weeks ago. I literally snapped my head in their direction and said, 'Holy cow! Where'd that come from?'"

Narek Shaverdian, another Penn undergrad, believes the ABCs of Neuroscience has sown "sparks of excitement" in the minds of the Sayre students, but Fluharty traces the pathway back the other way. Speaking of the ninth-graders, he comments, "These kids don't realize what a wonderful learning opportunity they're giving to our students." ■

—PETER NICHOLS

**The students are groping for the ideal mix of science and fun.**



Top: Steve Fluharty (left) and Penn students at Sayre School  
Bottom: 2004 Kids Judge! Neuroscience Fair