

# An interactive neuroscience program for high school students

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## Introduction

The BrainWaves program supports **high school students'** creation of their own **neuroscience research study** in the classroom, using Electroencephalography (**EEG**). The curriculum provides an overview of neuroscience including the implications of neuroscience to **public health**. Students are also encouraged to think critically about how their **lifestyle choices** affect their own brain health.

## Fall 2016 - Present

BrainWaves has been implemented at fifteen NYC public high schools. The schools implemented the program for either the entire year or over the course of a semester. The BrainWaves team provided schools with a mentor and a 14-channel emotiv EPOC headset.



## **Research Instruments**

- Pre/Post Student Surveys Measuring Attitudes Towards Science, Neuroscience Content Knowledge, and Proficiency in the Scientific Method
- Student, Teacher, and Mentor Interviews

## Curriculum

The BrainWaves curriculum is comprised of two units that span the length of the course. Students cover topics ranging from structure and function of a neuron to the analysis and presentation of their EEG experiments. The curriculum was developed using a backwards design approach and incorporates the NGSS. Furthermore, units are structured around a 5E inquiry model.

### Unit 1: neuroscience crash course

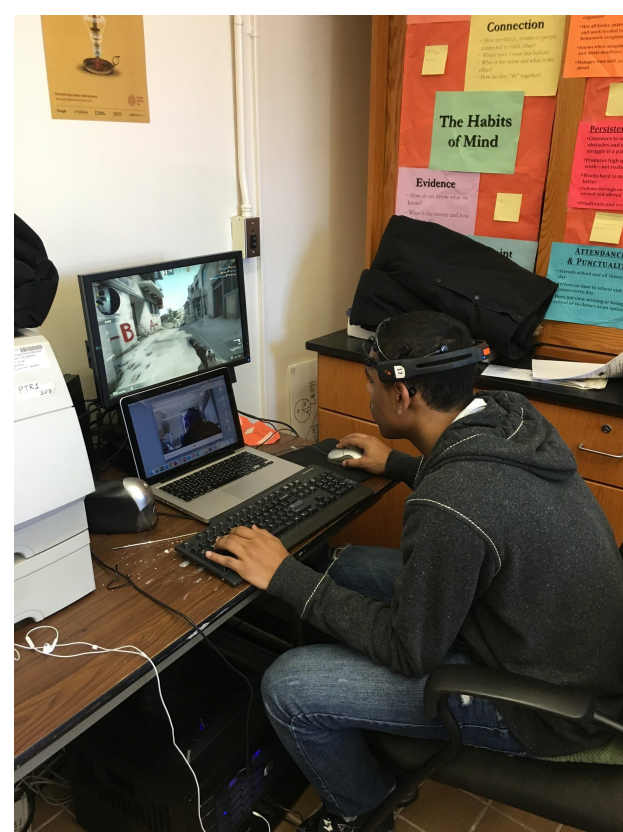
The first unit is a hands-on neuroscience mini-course which covers:

- content ranging from the cellular level to cognition
- research design



### Unit 2: students as EEG researchers

In the second unit, students become brain researchers. Small groups formulate and execute cognitive neuroscience-related research. They are mentored both by a scientist (typically, a grad student) and their science teacher.



Under the guidance of **science mentors**, students:

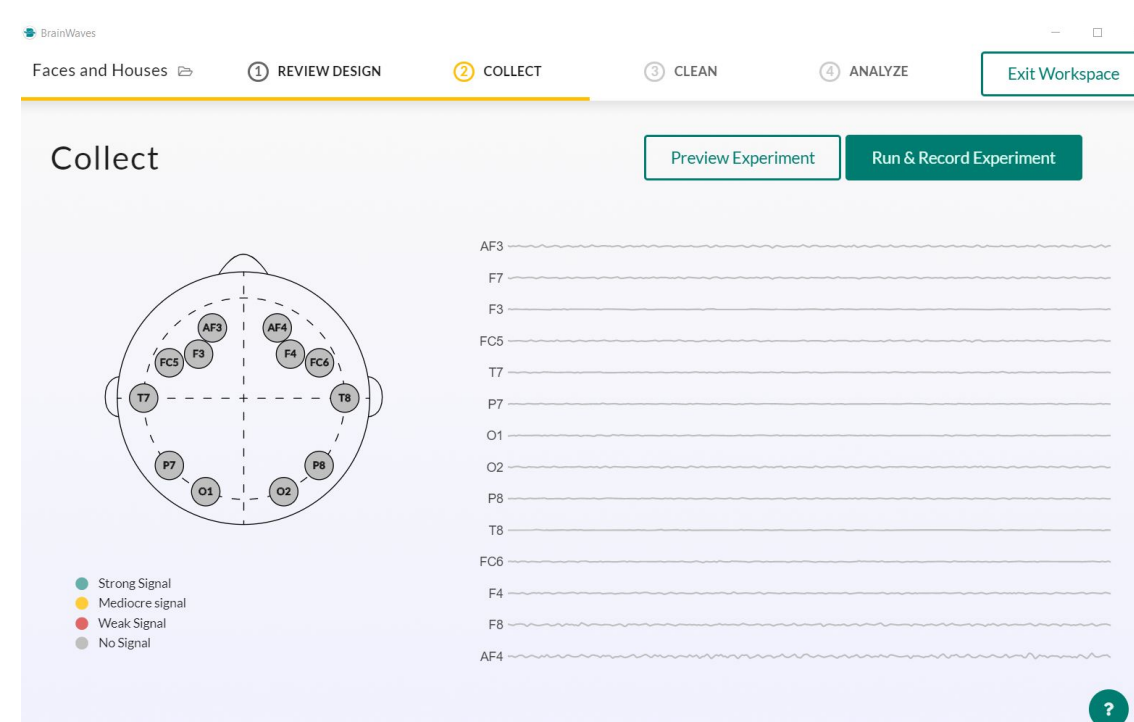
- design and develop a neuroscience experiment
- collect and analyze EEG data
- document and present their findings



## BrainWaves App

The BrainWaves Application allows students to:

- design a neuroscience experiment with customized stimuli
- collect behavioral and EEG data
- analyze data



## Teacher Training

Teachers undergo a hands-on training where they:

- experience the major labs
- plan for implementation
- learn about neuroscience research
- interact with the BrainWaves App

