

# **Brain Hackers Online: A Social Media Platform for Teaching Science**

**Chris Forsythe, PhD**

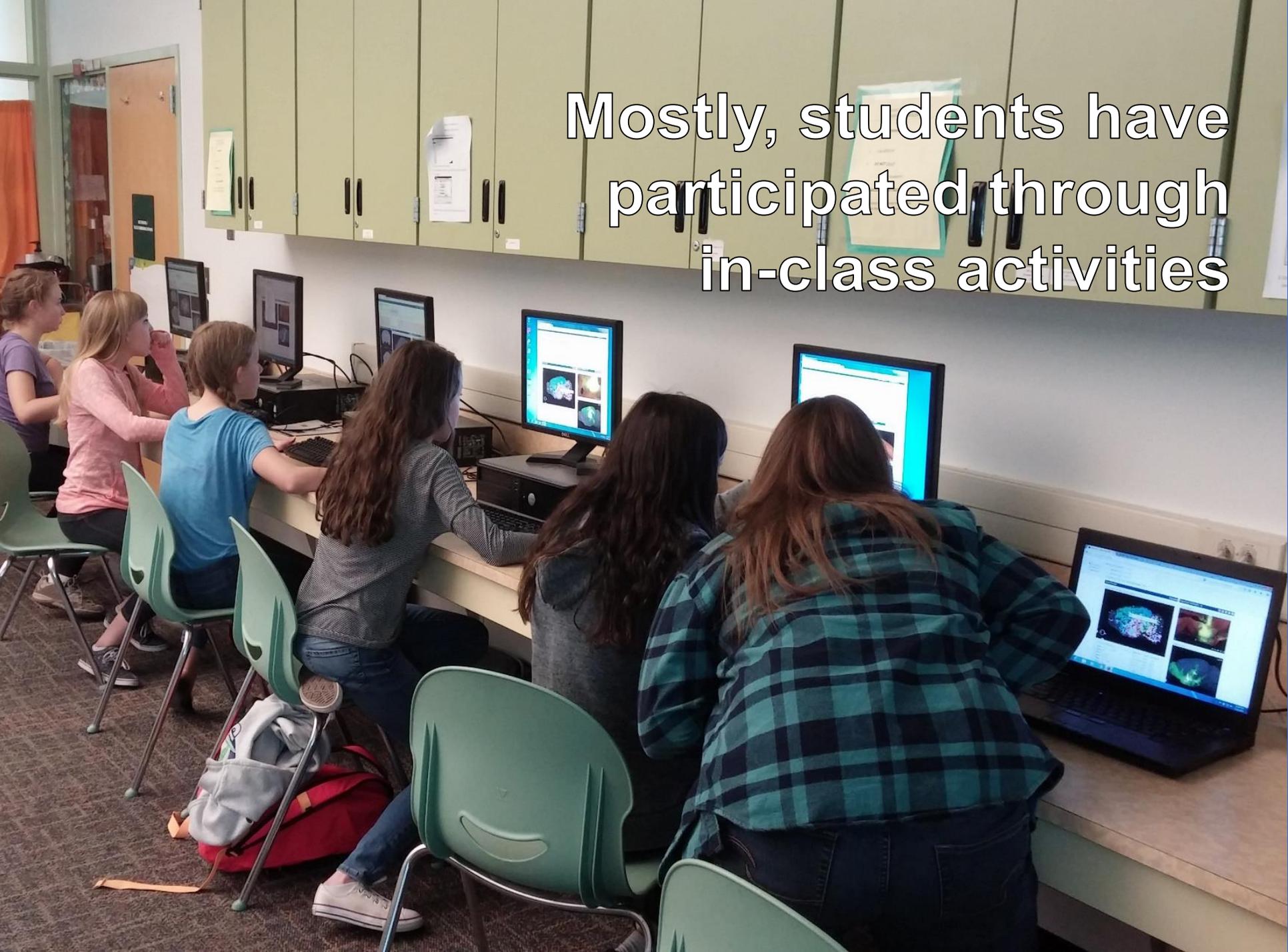
**President and Founder**

**Brain Hackers Association**

**During 2016-17  
school year,  
we were in 28  
schools with  
over 2,500  
students  
participating**



Mostly, students have participated through in-class activities



# Brain Hackers activities have included



Girl Brain / Boy Brain



Sheep Brain Dissections



Polygraph



Sidewalk Illusions



Android App & Game Development



Prosthetics



Robotics

**The prosperity  
and security of  
our nation  
depends on our  
youth learning  
science and  
technology**



**We want to  
change the way  
students think  
about science**



**Science and  
technology is the  
most CERTAIN  
path to  
prosperity**





Whatever your interest, you will do better if you know science and technology





**Scientists  
are not  
chomps**

# Science teaches mental toughness





**Science gives  
us cool stuff**

Science is something  
friends do together



**Science is for  
everyone**



# Brain Hackers Online



# Apply what the Internet has taught us



Community



Curiosity



Makers

Expression



Crowdsourcing

Competition



# NeuroSleuth demonstrates the power of team competition

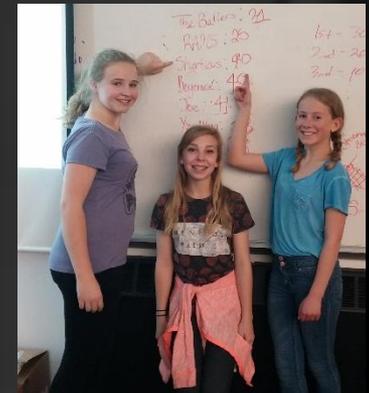


Team competition using Jeopardy-Inspired Game Engine

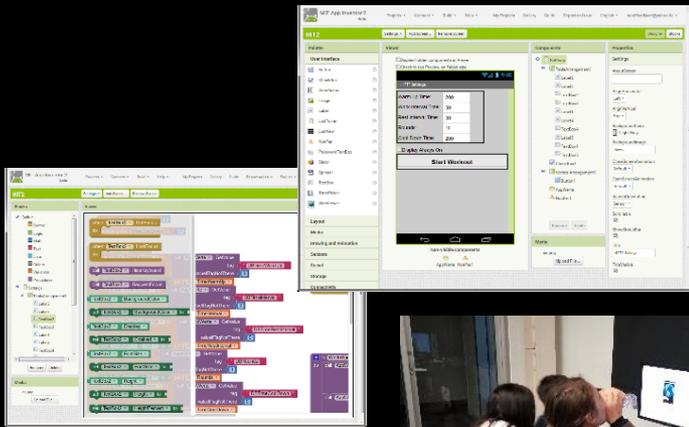


Students learn to use online 3-D Brain Connectivity Atlas

Challenges					
Memory	Memory 100	Memory 200	Memory 300	Memory 400	Memory 500
Brain Stem	Brain Stem 100	Brain Stem 200	Brain Stem 300	Brain Stem 400	Brain Stem 500
Motivation and Emotion	Motivation and Emotion 100	Motivation and Emotion 200	Motivation and Emotion 300	Motivation and Emotion 400	Motivation and Emotion 500
Motor Systems	Motor Systems 100	Motor Systems 200	Motor Systems 300	Motor Systems 400	Motor Systems 500
Sensory Systems	Sensory Systems 100	Sensory Systems 200	Sensory Systems 300	Sensory Systems 400	Sensory Systems 500



# Hackathons allow students to be Makers

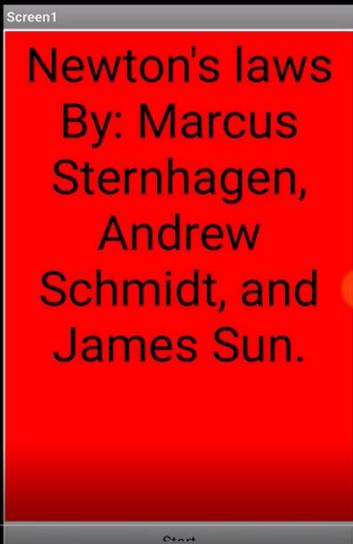
A stylized illustration of a human brain with various tools and symbols integrated into it. A ladder is on top, a compass is on the side, and a microscope is on the right. The letters 'W', 'E', and 'S' are scattered on the brain's surface. The background is a blue and white hatched pattern.

Brain Hackers  
Game Jam

April 14-16, 2017  
Albuquerque, NM  
[www.brainhackers.net](http://www.brainhackers.net)

# *App/Game development reinforces and elaborates learning*

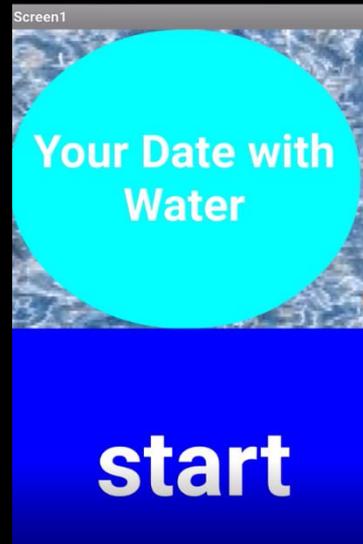
**Newton's  
Laws**



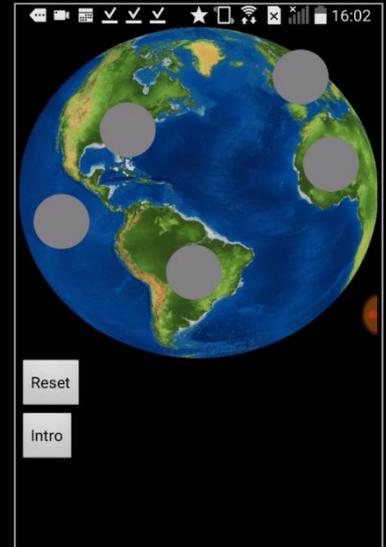
**Creature  
Elimination**



**Date with  
Water**



**Plate  
Tectonics**



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## Creature Elimination

Create your own species of animal  
Imagine a

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Brain Hackers Online is a social media platform that applies what we have learned from the Internet to engage students in science

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## The brain of a Time Lord

A Time Lord relies on superior intelligence to save the day. But what could be the underlying scientific properties of

# *Elements of success*

## Brain Hackers Online



**Skills  
Development**



**Ubiquitous  
Access**



**Mapping Science  
Curriculum**



**Creative Design**



**Competitive  
Event**



**Sharing  
Repository**



**Community of  
Peers**



**Incentive  
Structure**

# 2017-18 Outreach Activities

# 2017-18 Outreach Activities

1. Teach basic skills using MIT App Inventor

2. App development applied to teach science topics

3. Team projects teach engineering product design

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## Creature Elimination

Create your own species of creature and watch it evolve. Imagine a

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Articles are light-hearted, often silly, but rooted in an understanding of science

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**Science like the  
ONION**

# the ONION

## Everything Taking Too Long

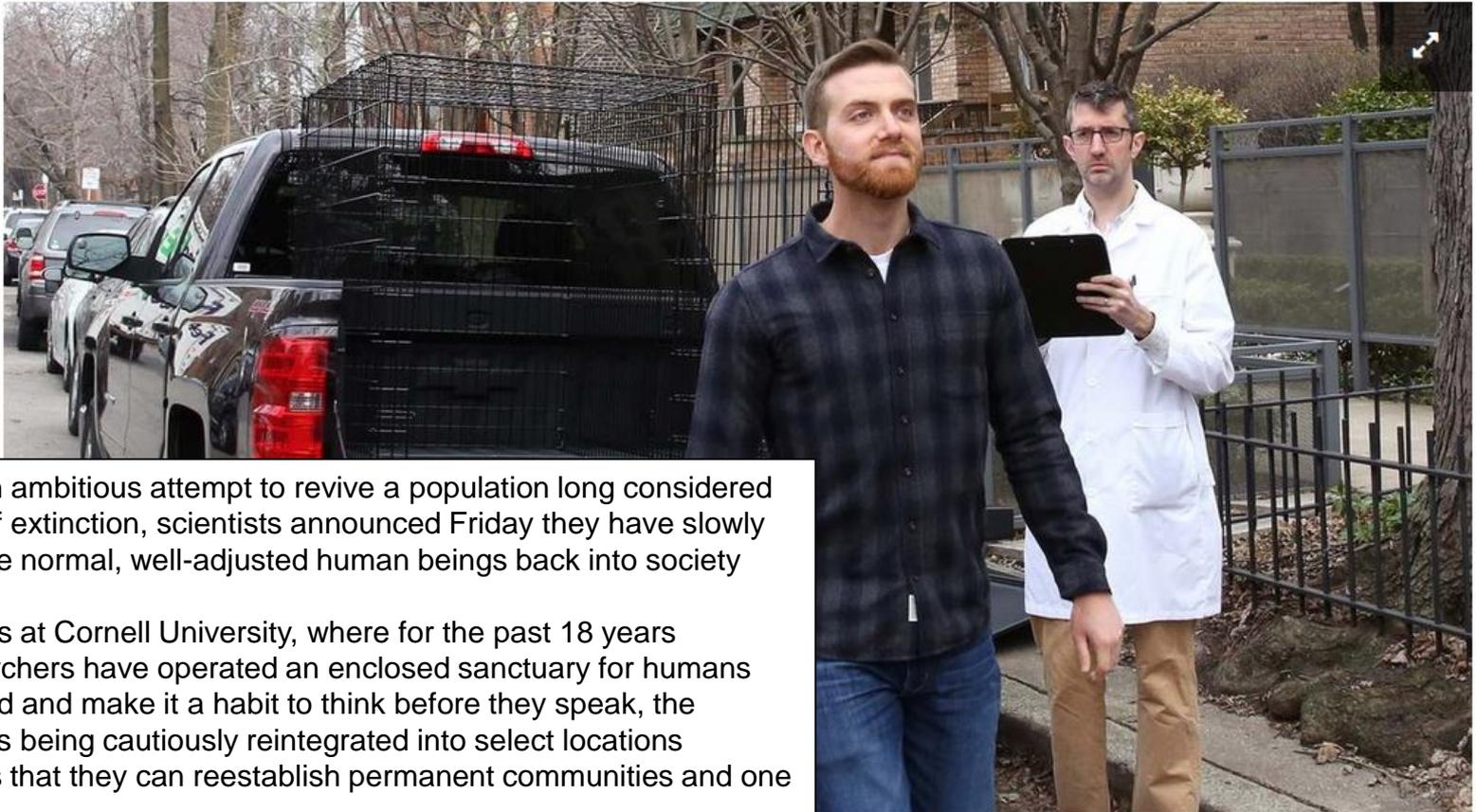


# the ONION

## Right To Privacy Not Guaranteed By Constitution, Says Supreme Court Justice Peeking In Bathroom Window



# Scientists Slowly Reintroducing Small Group Of Normal, Well-Adjusted Humans Into Society



ITHACA, NY—In an ambitious attempt to revive a population long considered to be on the brink of extinction, scientists announced Friday they have slowly begun to reintroduce normal, well-adjusted human beings back into society

According to officials at Cornell University, where for the past 18 years conservation researchers have operated an enclosed sanctuary for humans who are levelheaded and make it a habit to think before they speak, the endangered group is being cautiously reintegrated into select locations nationwide in hopes that they can reestablish permanent communities and one day thrive again.

## CERN Researchers Apologize For Destruction Of 5 Parallel Universes In Recent Experiment



GENEVA—Expressing deep regret over the catastrophic incident that occurred within the Large Hadron Collider, officials from the European Organization for Nuclear Research, also known as CERN, held a press conference Monday to apologize for the destruction of five parallel universes in a recent experiment. “We are sorry to report that in conducting research involving high-powered proton-proton collisions, we inadvertently caused the implosion of five universes nearly identical to our own,” said CERN Director-General Fabiola Gianotti, adding that billions of people worldwide might have experienced momentary vertigo around 9:45 a.m. as a result of several of their alternate identities being wiped from existence.

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Downloadable Android  
apps and games  
demonstrate and teach  
concepts from science

ould have survived evolution.

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Cre

## Demonstration

Create

Imagin

volution.

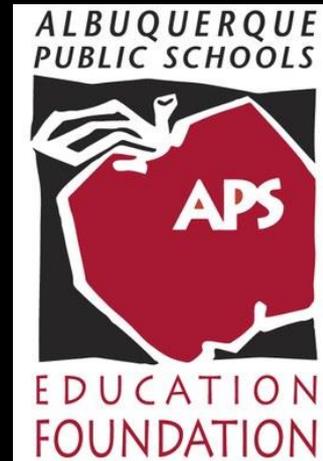
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### The brain of a Time Lord

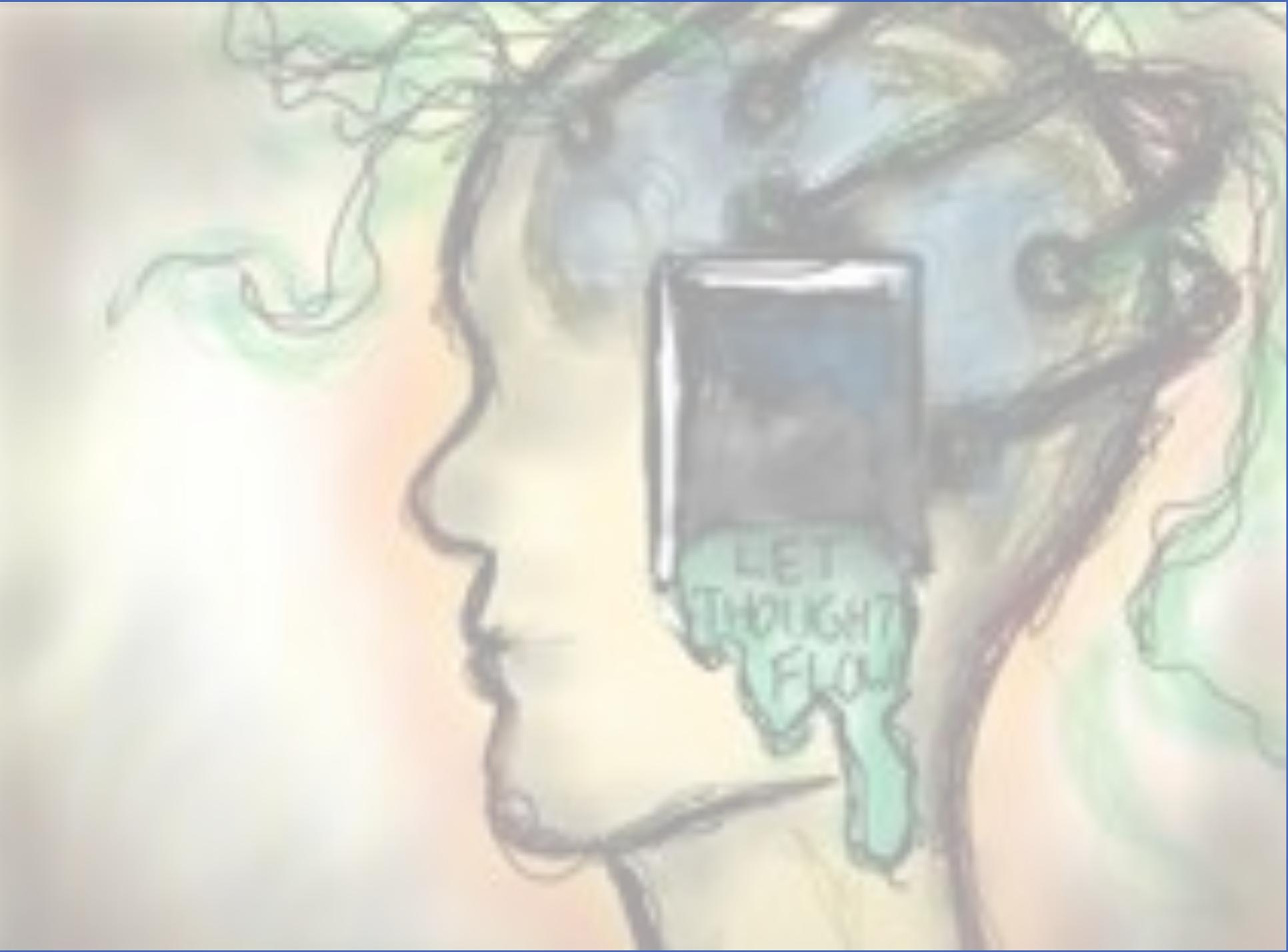
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# Acknowledgements

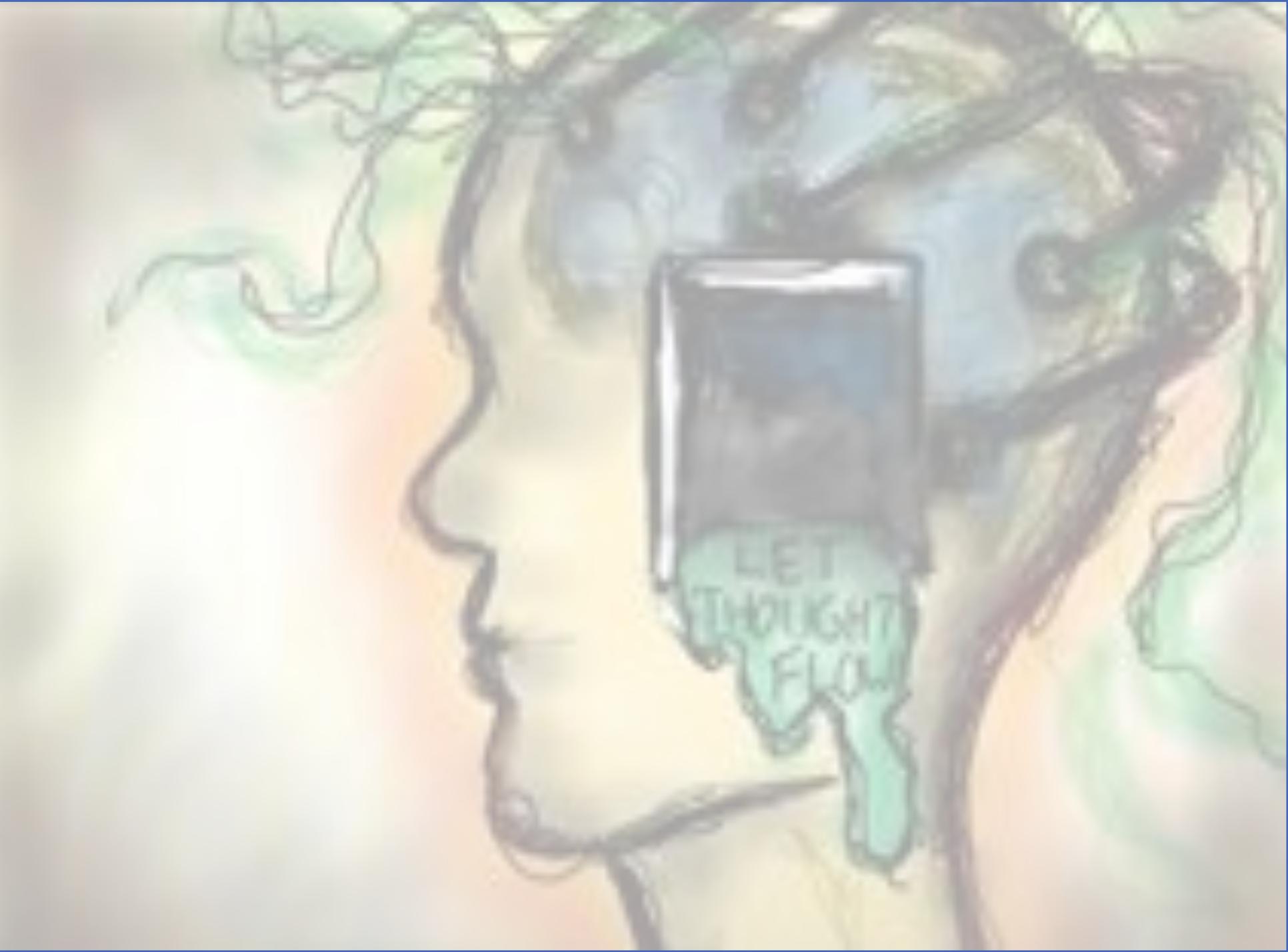




LET  
THOUGHT  
FLOW

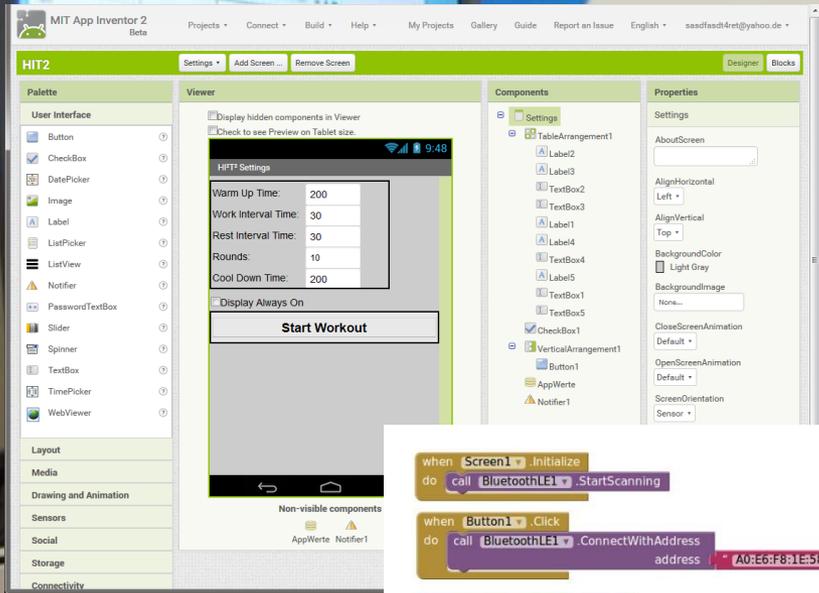


LET  
THOUGHT  
FLOW



LET  
THOUGHT  
FLOW

# Teach basic skills using MIT App Inventor



```
when Screen1.Initialize
do call BluetoothLE1.StartScanning

when Button1.Click
do call BluetoothLE1.ConnectWithAddress
address "A0:E6:F8:1E:58:57"

when BluetoothLE1.Connected
do set Label1.Text to "ON"
A text string.

when Button2.Click
do call BluetoothLE1.WriteLineValue
service_uuid "0000410e-1212-efde-1523-785feabcd123"
characteristic_uuid "00001565-1212-efde-1523-785feabcd123"
value "151061510"
offset 0
```



# App development applied to teach science topics



# Team projects teach engineering design

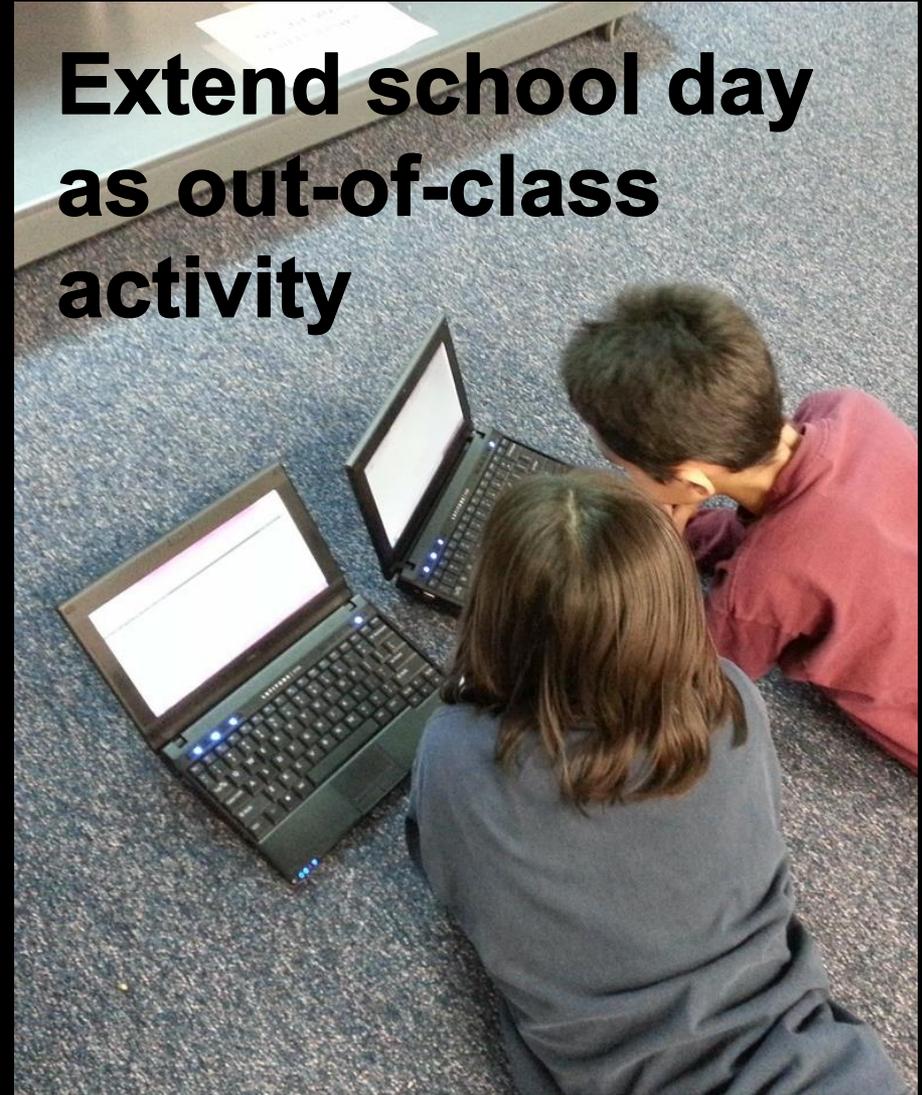


# Parallel goals

**App development  
incorporated into  
classroom**

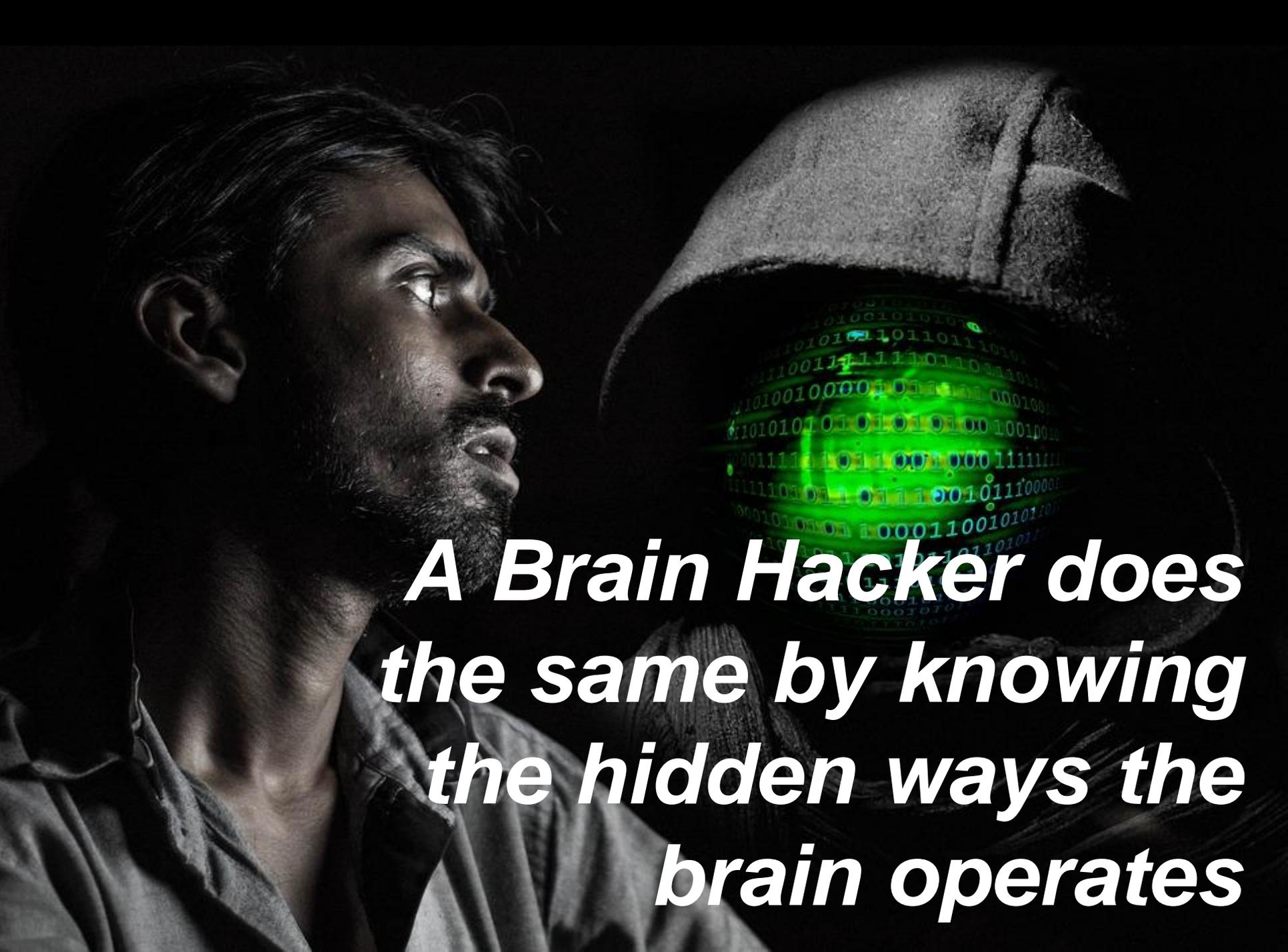


**Extend school day  
as out-of-class  
activity**



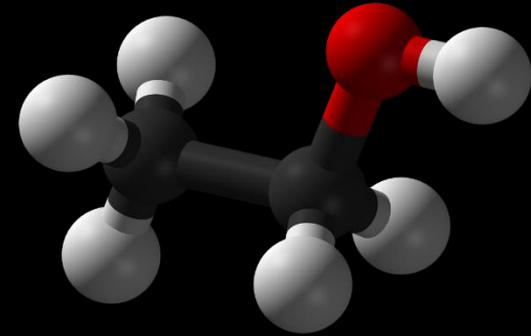
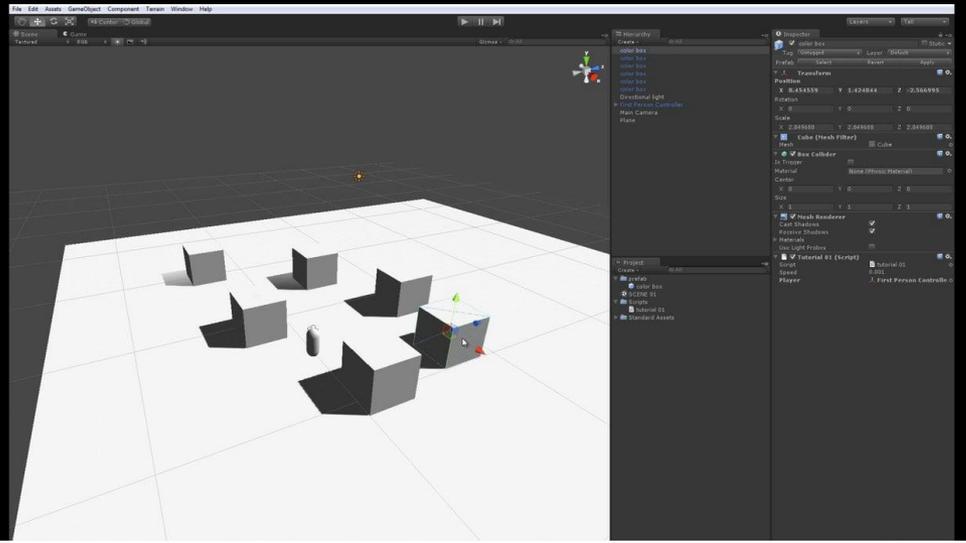
***Hackers study  
computers to find  
backdoors and  
vulnerabilities they  
can exploit***



A man with a beard and long hair is shown in profile, looking towards the right. In the background, a human skull is visible, but the face area is replaced by a glowing green sphere of binary code (0s and 1s). The overall scene is dark and atmospheric, suggesting a theme of digital hacking or neuroscience.

***A Brain Hacker does  
the same by knowing  
the hidden ways the  
brain operates***

# Unity to create 3-D models for printing and Virtual Reality



# Modern Science Still Only Able To Predict One Upcoming Tetris Block



CAMBRIDGE, MA—During a press conference Thursday at the Massachusetts Institute of Technology, leading members of the scientific community confirmed that despite decades of research, the best available theoretical models still cannot predict more than one upcoming Tetris block.

While they have long possessed the technology to accurately forecast and display which of the seven distinct Tetris shapes, or tetrominoes, will appear next, scientists told reporters they've so far had no success determining what any of the blocks beyond the immediate successor will be.

## Psychologists Say It Perfectly Natural To Fantasize About Sandwiches Other Than One Currently In Hand



BOULDER, CO—Saying such feelings of desire were observed in nearly every individual they studied, psychologists from the University of Colorado released a report Thursday concluding that it is perfectly natural for people to fantasize about sandwiches other than the one presently in their hands.

The study, which surveyed more than 500 adults from a variety of socioeconomic and ethnic backgrounds, determined that 89 percent of subjects had, at least once during the previous six months, vividly imagined a different sandwich while sitting down at the table with their current hero, hoagie, or po' boy.