

## Introduction:

My name is Chris Bruce. I teach High School Physics, AP Physics C, and AP Biology in Illinois, and am a registered developer with Apple and Google. I teach in a team of five physics teachers, and what you see here is a team effort.

## History:

3 years ago, our district decided on iPads, which meant no PhET, no MOPs, no Java simulations. At the time, our technology coordinator said "With this new HTML5 technology, pretty soon someone will make all the tools you need." That someone was us.

- ➔ The hard way to build apps: Objective C -> "Step2Step Physics" on iTunes
- ➔ The easy way to build apps: HTML5-> [www.simbucket.com](http://www.simbucket.com)

## Activity:

[www.simbucket.com](http://www.simbucket.com) -> "Go to the sims!"

1. Pull out cell phone, click on "Accelerometer", then drop your phone. It should read  $-10 \text{ m/s}^2$ . We used this in the elevator, calculating sliding friction, and in circular motion.
2. Go back to simulations, click on "Aluminum Can Polarization". Try it out.
3. Go back to simulations, click on "Electrostatics Landscapes Lab". Open simulation on phone, open the "PDF version of lab" on computer.
4. Go back to simulations, click on "Racetrack". Try "Hard" in less than 20 moves.

## 4 ways to use simulations:

1. Data collection - "Accelerometer", Rebecca Vieyra's work
2. Concept demonstration - "Aluminum Can Polarization"
3. Lab replacement - "Electrostatics Landscapes Lab"
4. Online problem/game - "Racetrack" - Scores/completion are tracked

## Requirements for each simulation:

1. Works on both touchscreen and mouse/keyboard
  2. Runs at a reasonable speed on all devices
  3. Kid-friendly and richly interactive
  4. Create and publish in <20 hours (we are teachers, after all!) -> all of our physics teachers can contribute, even if they have no programming experience
- > Construct 2! (Show Construct 2), available for free download at [www.scirra.com](http://www.scirra.com)

Switch to Windows desktop to show Construct 2 in action.

## Other free HTML5 resources:

PhET HTML5 simulations ([phet.colorado.edu](http://phet.colorado.edu))

The Physics Classroom ([www.physicsclassroom.com](http://www.physicsclassroom.com))

[www.tandftechnology.com](http://www.tandftechnology.com)

Questions?

Name	Automatically Shows "Completion" with Stars or Similar	Worksheet Available on <a href="http://www.simbucket.com">www.simbucket.com</a>	Worksheet Available on <a href="http://www.physicsclassroom.com">www.physicsclassroom.com</a>
Kinematics			
Accelerometer			
Graphs and Ramps	X		
Vector Addition			
Vector Guessing Game			
Projectile Simulator			X
The Monkey and The Zookeeper			
Forces			
Atwood Lab			
Rocket Sled			X
Skydiving			X
Energy			
Roller Coaster Model			X
Angular Acceleration Lab		X	
Momentum and Impulse			
Collision Carts Lab		X	X
Keiki's Impulse Game	X		
Circular Motion and Gravity			
Racetrack	X		
Satellite Motion		X	
Galaxy Simulator			
Orbital Motion			X
Gravitation			X
Electrostatics			
Aluminum Can Polarization			
Charging Game	X		
Coulomb's Law			
Electric Field Game	X		
Charges and Fields			
Electrostatics Landscapes Lab		X	
Water Simulation			
Circuits			
DC Circuit Builder		3 Labs	
Waves and Sound			
Mass on a Spring			
Simple Wave Simulator			
Standing Wave Simulator			
Slinky Lab			
Optics			
Least Time Principle			X
Lenses and Mirrors Lab			
Refraction			X
Biology / Chemistry			
Browns Eat Greens			
Dissolving a Salt Crystal			
Osmosis			
Phospholipids			
Water Simulation			