

### Year 1 Reflection of iPad Use in Chemistry and Living Environment Classes

The table below summarizes how I have integrated a set of 20 iPads in my lesson design and classroom facilitation of learning experiences for chemistry and living environment students over the course of the 2012-2013 school year. The apps mentioned are free and have proven to be effective in terms of teacher and student usage.

Category	iPad App	Context
Living Environment	RCSB PDB; Molecules	Students made observations on various types of protein molecules. Students also were able to manipulate various molecule models and look for potential drug interactions
	Click & Learn	HHMI's biointeractives were used as self-directed enrichment activities.
	Bio Ninja IB	Supplemented unit topics with text, quizzes and assessments
	Microcosm	This app was used as a hook to intrigued students about the scale of things
	Food Web	Students applied their understanding of ecology and invasive species to design food webs based on biotic interactions characteristic of the Kimberley region in Australia
	Meiosis	"Snurffe" meiosis was used to reinforce topics in genetics.
	iCell	Students compared and contrasted eukaryotic and prokaryotic cell types using the interactive models
	Evolutionary Biology	Within 5 minutes of playing the DNA synthesis game students mastered the "base-pairing" rule; Revisited app during evolution unit to investigate genetic drift and natural selection using interactive games and simulations
	EarthViewer; Ocean Science	Students researched the timeline of Earth and associated major biological and geological events. In addition, students analyzed data related to: <ul style="list-style-type: none"> <li>• oxygenation of the planet</li> <li>• evidence of early photosynthesis</li> <li>• trends in Earth's surface temperature and carbon dioxide composition</li> <li>• the relationship between oxygen and animal size life and chemical cycling</li> <li>• the carbon cycle</li> </ul>
	Earth as Art; NASA Viz	Students used these apps to investigate the relationship between climate and environmental change
	WWF Together	Students really enjoyed perusing this app. The

		imagery, captions, and overall design were very engaging. Students learned about the causes, effects and preventative work being done across the globe in response to endangered species.
	Creatures of Light: Nature's Bioluminescence	Students explored the diversity of bioluminescent organisms living in a variety of environments. In addition, I was able to review enzyme-substrate reactions by referring to mechanisms for bioluminescence.
	Leaf Snap HD	Students used this app to identify and characterize the plant samples they collected while surveying 10m x 10m areas across the school grounds.
	Build a Body; Body Atlas; Anatomy 4D	These apps were used as refreshers since it was determined that the students already had foundational knowledge related to the human body. The apps helped to reacquaint the students with the different body systems, related organs and interconnectedness.
	VCell	The simulations were used as: <ul style="list-style-type: none"> <li>• Enrichment of concepts related to cellular respiration, RNA expression and protein expression</li> <li>• Reinforcement of mitosis and meiosis</li> </ul>
Chemistry	Atoms HD Lite; Nuclear	Students: <ul style="list-style-type: none"> <li>• reviewed atomic structure by "building an atom"</li> <li>• constructed a timeline using the facts listed within the "atomic theory history" option</li> </ul>
	Atoms in Motion	Students used this app to explore the behaviors of particles which ultimately led to them defining the kinetic molecular theory
	Formulas Lite	Students were able to practice deriving chemical names and formulas for polyatomic ions and organic functional groups.
	Nova Elements ; QRC Elements	Students researched elemental properties and identified periodic trends
	Gas Laws HD Lite	Simulations were used to collect data and define trends related to Boyle's Law and Charles' Law
	Lewis Dots	Students were introduced to Lewis Dot Structures and simple ionic compound formation.
	Molarity	Students were able to double check their calculations when making various solutions. I've also taken advantage of this app when making stock solutions 😊
	Periodic Table	This was an excellent app for students to: <ul style="list-style-type: none"> <li>• research periodic trends (states, MP, BP, electronegativity, radioactivity)</li> </ul>

		<ul style="list-style-type: none"> <li>describe characteristics of metals, nonmetals, and metalloids</li> <li>practice with writing electron configurations</li> <li>practice with drawing bohr models</li> <li>identify and characterize groups</li> </ul>
Inquiry tools	Color uncovered	This is a really fun, engaging app that describes and explains a variety of optical illusions.
	Fit Brains	Games designed to enhance concentration and memory. Problem solving, speed and visual are available for a fee.
Lab tools	LabTimer	Over 16 timers can be set using this app. While we only needed 1 of the timer functions, it would have been useful back in grad school ☺
	Free GraCalc	Free graphing calculator
Classroom tools	Nearpod	<p>This app helped me streamline my "formal" instruction time by delivering multi-modal presentations directly to each student's iPad. I've incorporated real-time formative assessments that give me immediate feedback that I could opt to share with the students.</p> <p>One student suggested that Nearpod would be useful for those students who were absent yet had access to an iPad/iPhone. During scheduled class time, students could enter the class pin and still be involved in the presented material.</p>
	Paper; Doceri; Inkflow	These sketching apps were used as quick tools for formative assessment during class. For example, I've asked students to sketch a DNA molecule or a Lewis dot structure.
	Haiku Deck	Students used this app to make creative presentations
	LessonNote	Used to collect lesson data to improve facilitation, student engagement, and balance.
	iBrainstorm	Some students used this app when brainstorming experimental designs and debate stances.
	Evernote	This app was imperative to me recording and sharing student work.
	QCards	Students with Quizlet accounts were able to access existing materials from their online accounts while also searching for new flashcards to help with studying
	Dragon Dictation	Converts speech to text in a fairly accurate manner
	Class Dojo	If I have access to the iPads next year, I plan to use this app to support and encourage universal student engagement and participation.

	VideoScience; Science 360; TED; Khan Academy; SciFri	These apps have given students alternative perspectives on relevant topics and have helped to reinforce covered content.
Web-Based tools	Today's Meet	Used as a backchannel for students to pose questions and comments during video clips.
	Google Apps	Google Form and Google Moderator have been useful in providing and analyzing real-time student responses. Google Doc has been very effective in group brainstorming, collaborative note-taking and peer review/feedback sessions.