

Possible Worlds



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1st Playable
PRODUCTIONS

A National Research and Development Center on Instructional Technology
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Can we make digital games that will...

- Enhance existing instructional environments?
- Play meaningful, specific roles in an iterative, multimodal teaching and learning process?
- Make possible improved outcomes on hard-to-teach, hard-to-learn concepts?

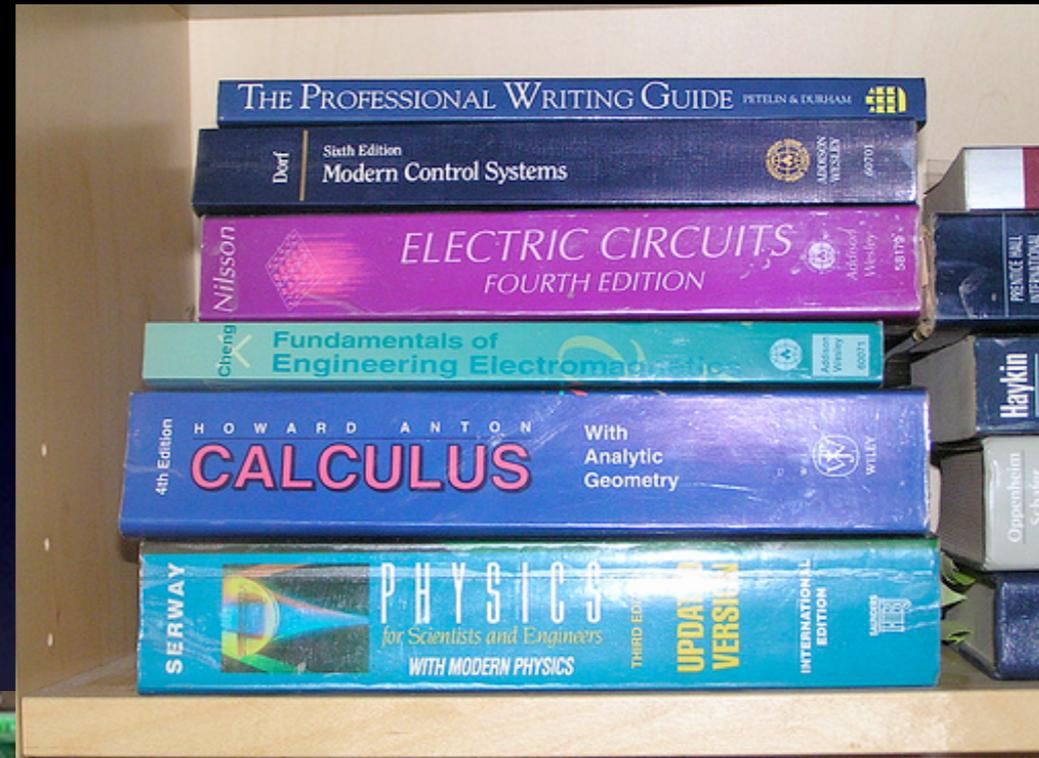
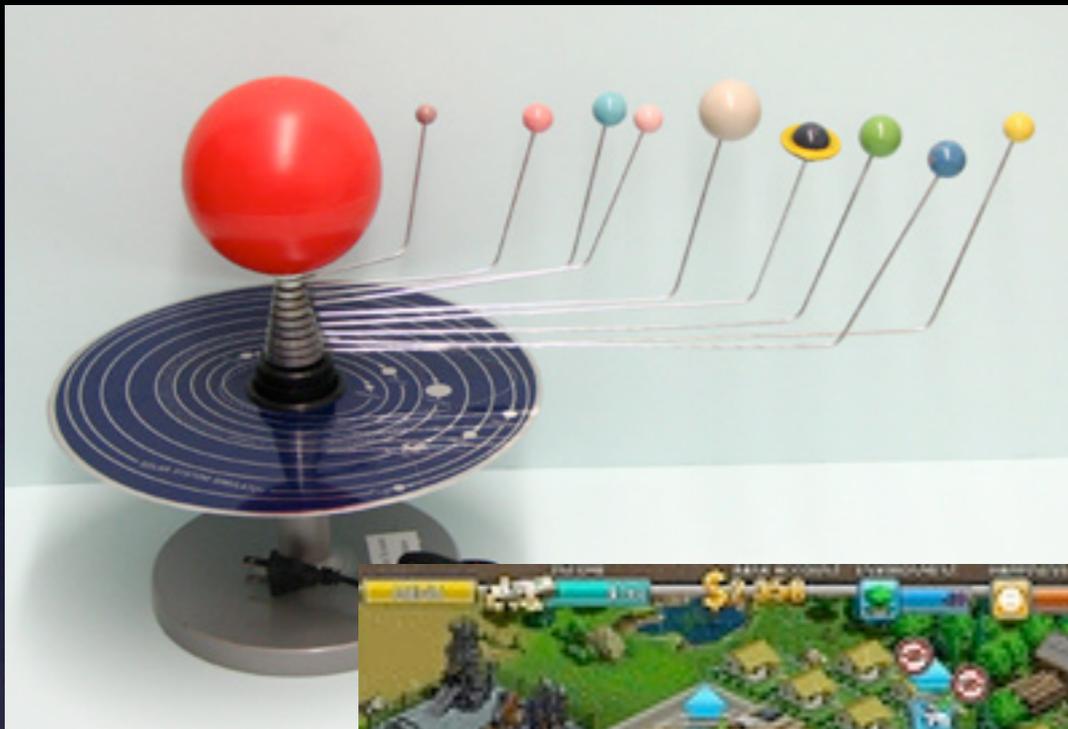
Starting points

- Portable devices (Nintendo DS and DSi)
- Middle grade science, both life and physical
- Common “scientific misconceptions”

Game play is homework



Game play occurs prior to instruction



 p_g	 d_ck
 ch_ck_n	 sh__p
 g__t	 r__st_r

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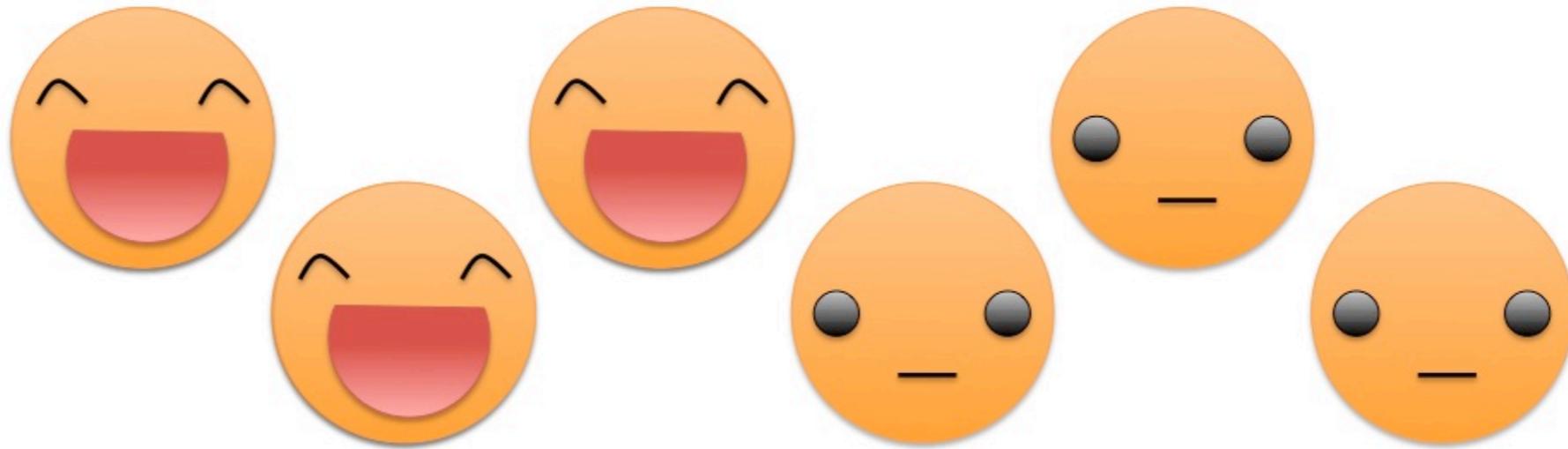
Game play produces shared experience of a core analogy





Teacher assigns game as homework

What else flows like a charge?



Laughter is often called “infectious”—
when you hear another person laugh, you sometimes start to laugh too,
even if you don’t really know what the other person is laughing about.

Regular instruction and activities
reference the game analogy

PET PIGS INSPIRE NEW PRODUCT

TWO PORKERS COULD SOON BE ROLLING IN IT

We'll soon have a pair of pigs to thank for the next big thing in cell phones. Their owner, an inventor called Gizmo Guy, says they inspired his superfast new phone-charging device. And he promises to give the pigs a share of the profits. "Fred and Ginger will be living high on the hog," he says with a smile.

"I come up with simple, cheap solutions for annoying problems," he says. "Like, for instance, the time it takes to charge a phone. I wanted to find a way to speed up the process. But I was stuck—until Fred and Ginger gave me a great idea."

It was a hot day, and Gizmo Guy was hosing down his pet pigs. After a while, the pigs moved out of range of the hose. To make the water reach them, he covered part of the hose's end with his finger. The smaller opening made the



HOG HEAVEN: Fred and Ginger could soon have lots of money in their piggy bank

Gizmo Guy figured that if he could speed up the flow of electricity to a charger, it would work faster. So he invented a gadget that would do that. He calls it SpeedE-Charge.

"It's a clamp that fits around an electric cord," he explains. "When you tighten it, it squeezes the cord. That forces the electricity to flow

SpeedE-Charge clamp won't touch the wire inside. So there's no danger of shocks."

Many people think charging a phone battery means filling it up with electricity. Not so, says GG. "Batteries don't store electricity. They store chemical energy. That gets converted to the electric energy the phone needs to work. When the battery's chemical energy runs out, you have to restore it. And the electricity from a charger can do that."



A consolidation activity invites application of new concepts

Core research questions

- **Usability:** To what extent are students, teachers and administrators able to accommodate the use of the DS for homework and in-class game play?
- **Links to instruction:** How do teachers leverage students' game play during regular instruction? How do they integrate other module elements into instruction?
- **Impact on learning:** Does the module improve students' understanding of the target concepts?



S: Well, you know, the roots go into the soil and it absorbs it. I was kind of thinking of fungus when I thought of it since it like breaks down the matter and like sucks it in...So I thought those were pretty similar. So I thought it was . . . the soil. Take in vitamins and minerals from the soil that it provides and breaks it down. Breaks down the matter and uses it.



R: To do photosynthesis...It makes food for the plant or the tree, it makes glucose. It helps the tree; it's like the tree's food.

I: And the food helps the tree do what?

R: Grow and make like the leaves and everything...It needs carbon dioxide and water, and sunlight. That's it. Helps it make glucose and oxygen.

I: So what's the role of the sunlight?

R: It splits up the molecules from the water and carbon dioxide.

So What?

- Schools and teachers with no special supports or infrastructure can accommodate portable digital devices and game play into instruction.
- Game play can support teaching and learning by engaging kids directly with relevant analogies. Leveraging these experiences requires skill and reflection.
- Evidence suggests participating students may be building novel, relevant categories that they retain and can use to support accurate scientific thinking.