

Rethinking Science Learning



A NEEDS ASSESSMENT

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**What ~~do we~~ need
simulations and
games to do to
improve science
education?**

Science education needs



—Career Interest

- i **1/3** high school students take one year of science
- i Of all doctorate-holding scientists:
 - ÷ **5%** are either African-American or Hispanic
 - ÷ **25%** are women

Science education needs



– Conceptual Understanding

- i **31%** say humans evolved through natural selection
- i **46%** do not know that an electron is smaller than an atom

Scientific inquiry



- Role in science education for over 100 years**
- Increases interest in science careers**
- Facilitates movement from prescience conceptions to scientific conceptions**

Scientific inquiry obstacles



- **Understanding scientific inquiry**
- **Equity of Access**
- **Teacher Education**

Role for sims and games



- Provide access for all
- Model scientific inquiry
- Help teach content with inquiry
- Role play
- Increase self-efficacy and science career choice

Scientific inquiry models?



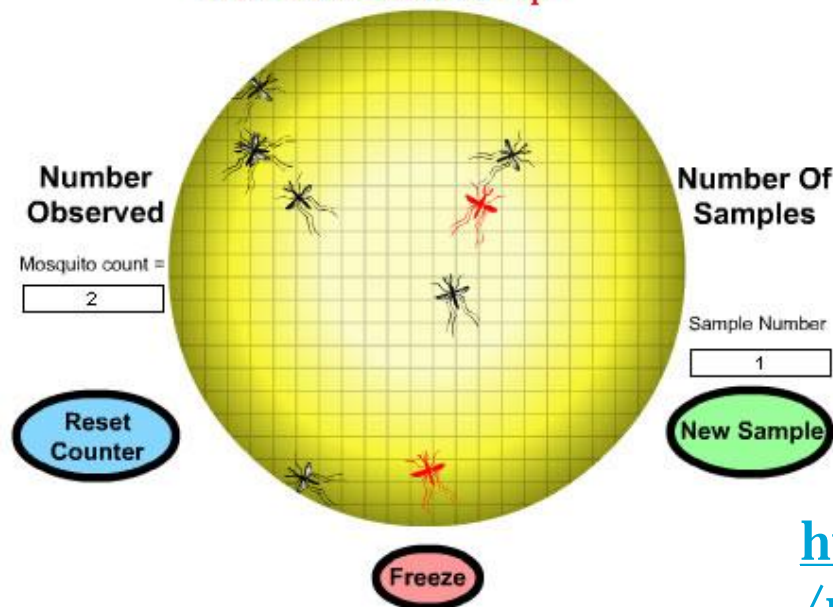
Ever wonder... what happens to the tread on tires?



Other than the large pieces of tire treads that you often see, the rest of the treads wear off gradually as particles and collect by the side of the road. The particles are too small to see with the naked eye, but it is estimated that the particle debris on the side of road makes up for about 50% of the missing tire tread. The rest of the tire tread is broken down through chemical processes such as oxidization and devulcanization or they degrade with help from wind, water and microbes

<http://www.wonderville.ca/>

The current site is Dump



<http://muve.gse.harvard.edu/rivercityproject/>

Recommendations



– Research

- i Meta analyses

- i Methodological rigor

– Assessment: what and how

– Needs-based design

“We’ve managed to turn people off of science by making it some kind of rote learning exercise”

Bruce M. Alberts (1995)

**92% OF ALL 2-17 YEAR OLDS
PLAY VIDEO AND
COMPUTER GAMES**

Thank you!



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