The Elements Unearthed:

Integrating Science & Podcasting

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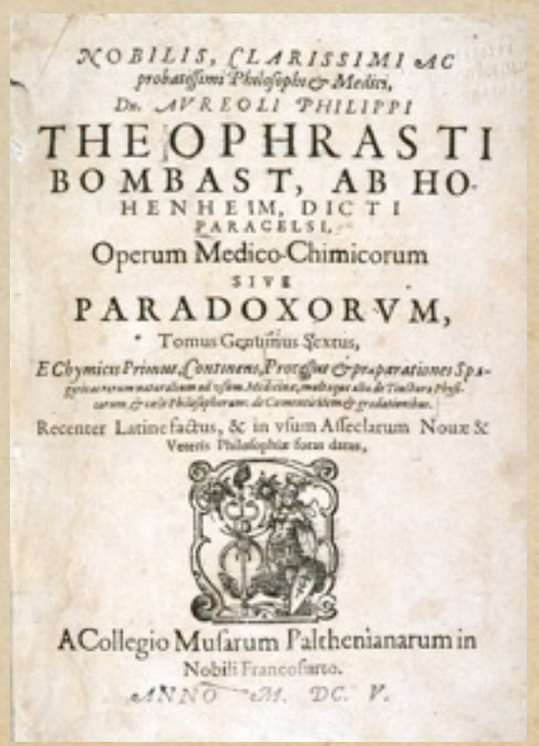
What is Podcasting?

- Three types: Audio, Enhanced Audio, and Video.
- Easily created using Garageband, iMovie, Soundbooth, or other programs. Anyone can make them, even students.
- Metadata (search tags, description and info. fields, etc.) added in iTunes or Podcast Maker.
- Self-published through an RSS feed from your website or blog to the Apple iTunes site and other aggregators.
- Available for free any time, anywhere, for anyone. New episodes automatically update in iTunes.

Elements Unearthed Project Purposes:

- To document the discovery, history, uses, sources, mining, refining, and hazards of the chemical elements, industrial materials, and energy production.
- To train teams of students and community members how to use digital technologies (including audio, video, blogs, and wikis) to tell the story of the elements in their own communities.
- To involve community experts (scientists, engineers, and historians) to ensure accuracy and to excite students about STEM careers.


NOBILIS, CLARISSIMI AC
probatissimi Philosophi & Medici,
Dn. AVREOLI PHILIPPI
THEOPHRASTI
BOMBAST, AB HO-
HENHEIM, DICTI
PARACELSI,
Operum Medico-Chimicorum
SIVE
PARADOXORVM,
Tomus Genuinus Sextus,
Recenter Latine factus, & in vsum Asseclarum Nouæ &
Veteris Philosophiæ foras datus,
A Collegio Musarum Palthenianarum in
Nobili Francofurto.
ANNO M. DC. V.

Phases of the Project:

- Phase I: Proof-of-Concept (2007-09). Development of process and creation of several sample episodes at MATC.
- Phase II: Prototype Development (2009-2011). Deployment of episodes to iTunes; background research; recruitment of teams for Utah, then neighboring states; training in person; collaboration with Subject Matter Experts.
- Phase III: Full-Scale Project (2011-2014). Open to all states, with training online. Teams collaborate to ensure quality.
- Phase IV: Ancillary Materials (2012-2015). Posters, website, games, video series, book, lesson plans, etc.

Timeline of Episodes:

- Ten episodes complete by May, 2009 (end of Phase I).
- 7-10 more episodes completed by Utah teams by May, 2010 (Part A of Phase II) plus three episodes completed on the history of chemistry and atomic theory.
- 7-10 episodes by non-Utah teams by May, 2011 (end of Phase II) plus more history and more Utah.
- 20+ more per year in Phase III from teams across country (2011-2014).
- 100+ episodes complete by May, 2014.

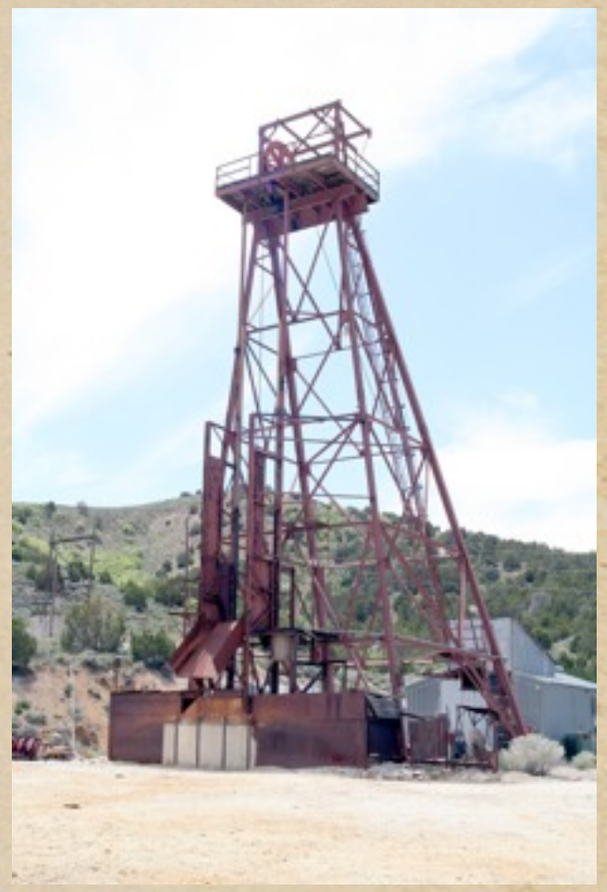
The Process

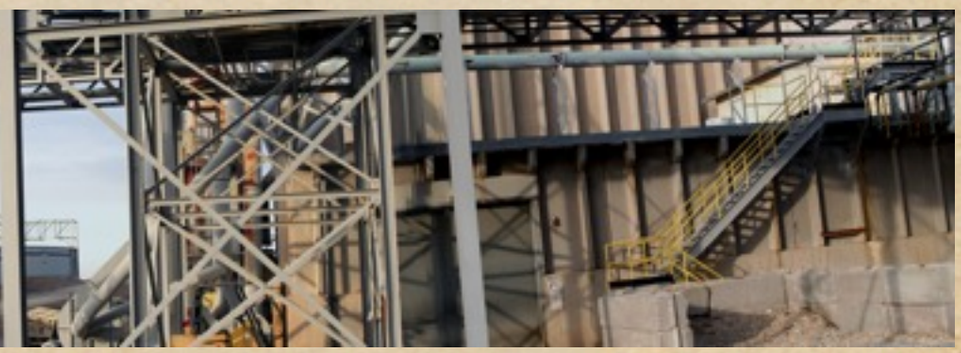
- Teams choose a topic, apply, and are selected (< May 1, 2009).
- Initial training is given (three hours in May, 2009) on research, copyright, collaboration (Wikis), and image preparation.
- Students research their topic and work with the Subject Matter Expert to develop a draft script (Summer, 2009).
- Detailed training (one week long - three hours per day after school) on videotaping and editing techniques. The team visits the site, interviews the expert, and videotapes the tour. Tapes are captured and transcribed (Fall, 2009).
- The team edits the video which is reviewed by other teams and the SME. A final video is produced, metadata added, and the video is posted to iTunes and YouTube (Jan.-April, 2010).

Samples of Phase I:
2007-2008

- Cement Manufacturing
- Beryllium Refining
- Tintic Mining District

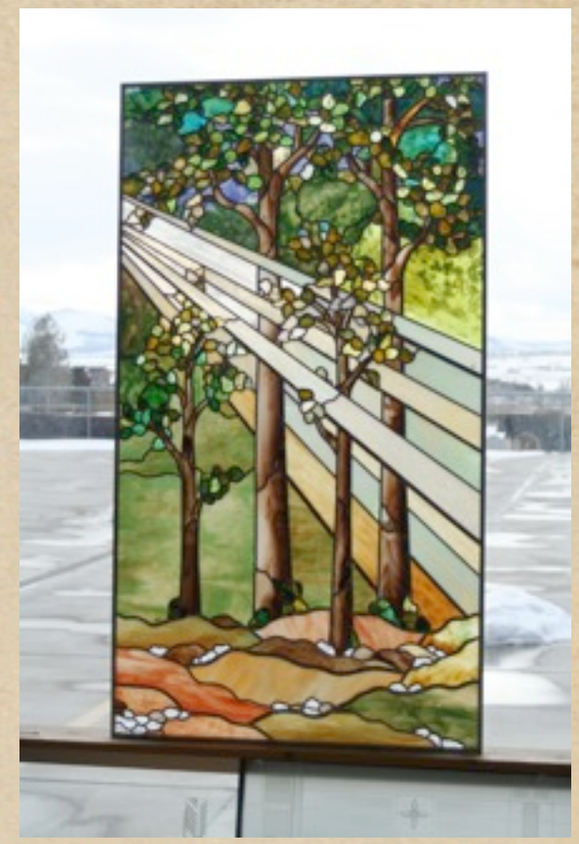
Samples of Phase 1:
2007-2008





Samples of Phase 1:
2008-2009

- Glass Blowing
- Stained Glass
- Liquid Air
- Synthetic Diamonds
- Pottery Making



Benefits to Your Students
(and to *you*)

- Explore Web 2.0 technologies, including Wikis, blogs, and podcasting.
- Learn media design skills & software, including Adobe Photoshop & Apple Final Cut Studio.
- Develop skills in photography & videography using digital cameras & video equipment.
- Document the history of science in your area and promote your community.
- Collaborate with other schools on a national project.

Qualifications of Teams:

- Four to six students, blend of science, history, media, and /or art. Must be 9-11 grade.
- Have access to nearby sites that are related to the elements, chemicals, materials, or energy.
- Schools or students have computers with appropriate software (Adobe CS, Apple Final Cut, or Adobe Premiere). Cameras will be provided.
- Preference given to rural/underserved schools.

Project Rationale:

Four Needs

- To protect lives
- To preserve the past
- To ensure the future
- To promote STEM careers

Val Roberts, a 37-year old Deseret farmer, kneels beside well he drilled where he wants to build home, but cannot get federal loan because well exceeds set arsenic standards.

Arsenic Ruling Upsets Millard Area

By Vern Anderson
Associated Press Writer

DESERET, Millard County — Val Roberts is puzzled because the federal government says it can't give him a loan to build a house since there's too much arsenic in his well water.

He's confused, says Roberts, because the arsenic level in nearby Hinckley is higher than in Deseret, although folks in Hinckley can get the same type loan he wants.

Roberts said the root of the problem is "regulatory agencies enforcing arbitrary rules ... regardless of how it affects you.

"I don't think it's right," said the 37-year-old father of six.

"If arsenic is really harmful to us then we don't want to drink it. But we don't think it is."

Twice Level

The Farmers Home Administration says the water in Roberts' well contains arsenic at a level just over 100 parts per billion — twice the level of 50 parts permitted by the state and the Environmental Protection Agency. Arsenic is a heavy metal that can be fatal in much higher doses.

Hinckley has a central water system built in 1968 with state Division of Health approval. Tests of the water a few years later — the first to be run — showed arsenic levels of about 200 parts per billion, or four times the standard set by EPA.

Loans Approved

Gayle Smith, state Bureau of Water Works director, said building loans are being approved in Hinckley because the state has given the town's water system a "classification pending" rating while awaiting results of an EPA-funded study of arsenic and its effects on area residents. The two-year study will be completed early next year.

Unless EPA allows state officials to grant a variance, Smith said, "It's just a matter of time before we'll have to rate the water system in Hinckley as not approved." Last year, the National Science Foundation recommended EPA not relax its arsenic standard.

Residents in Doubt

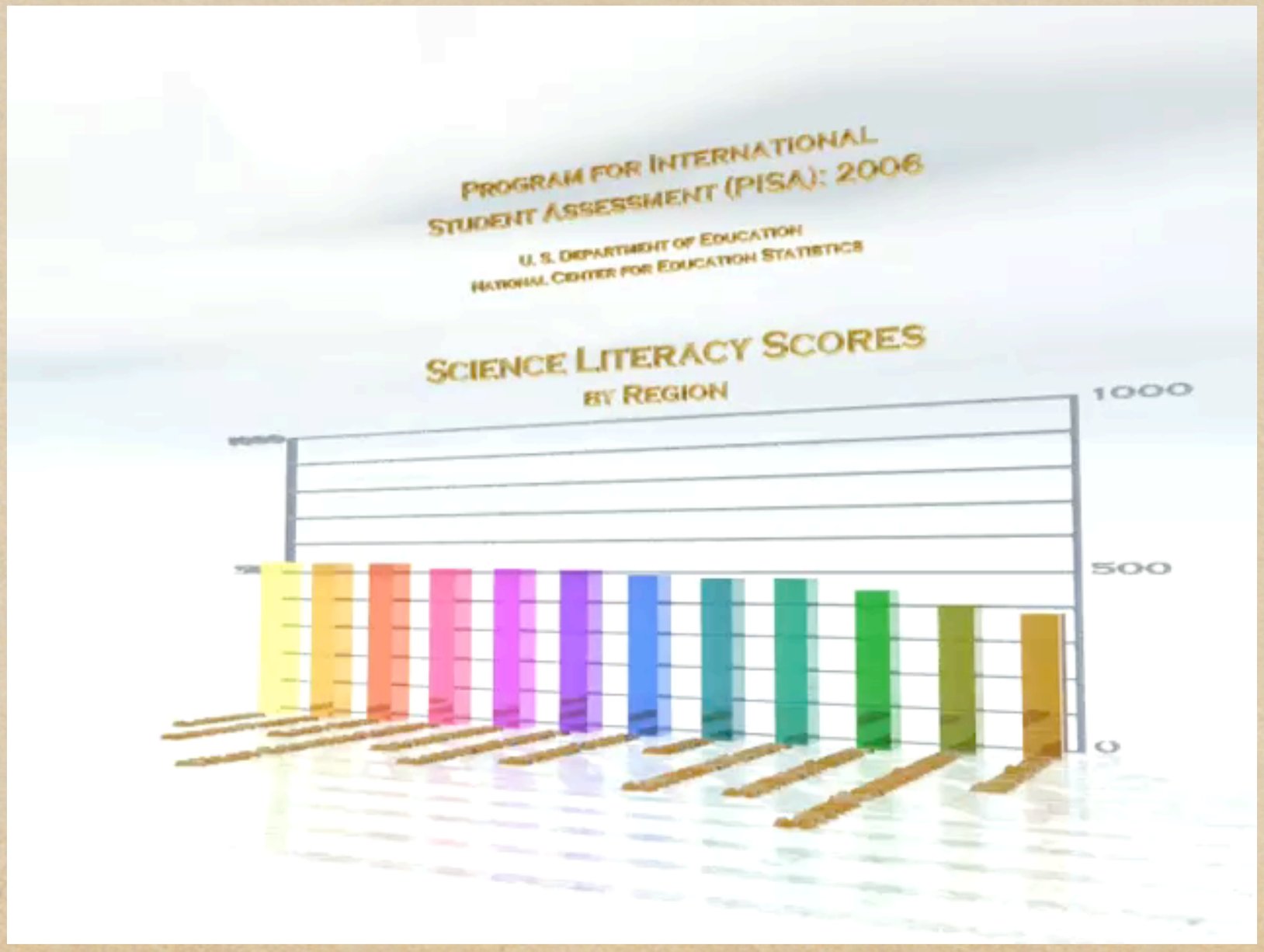
Many Deseret and Hinckley residents doubt there is a health hazard. They point to residents in their 80s who apparently are in robust health after years of drinking the water.

"I guess everybody hears that word — arsenic — and says, 'Aha! Poison!' But we're talking about low amounts," said one state health official.

The Hinckley-Deseret area of Millard County is the only one in Utah where the water — percolating through geologic formations — picks up appreciable amounts of arsenic.

STEM Career Stats

PISA 2006 Science Literacy

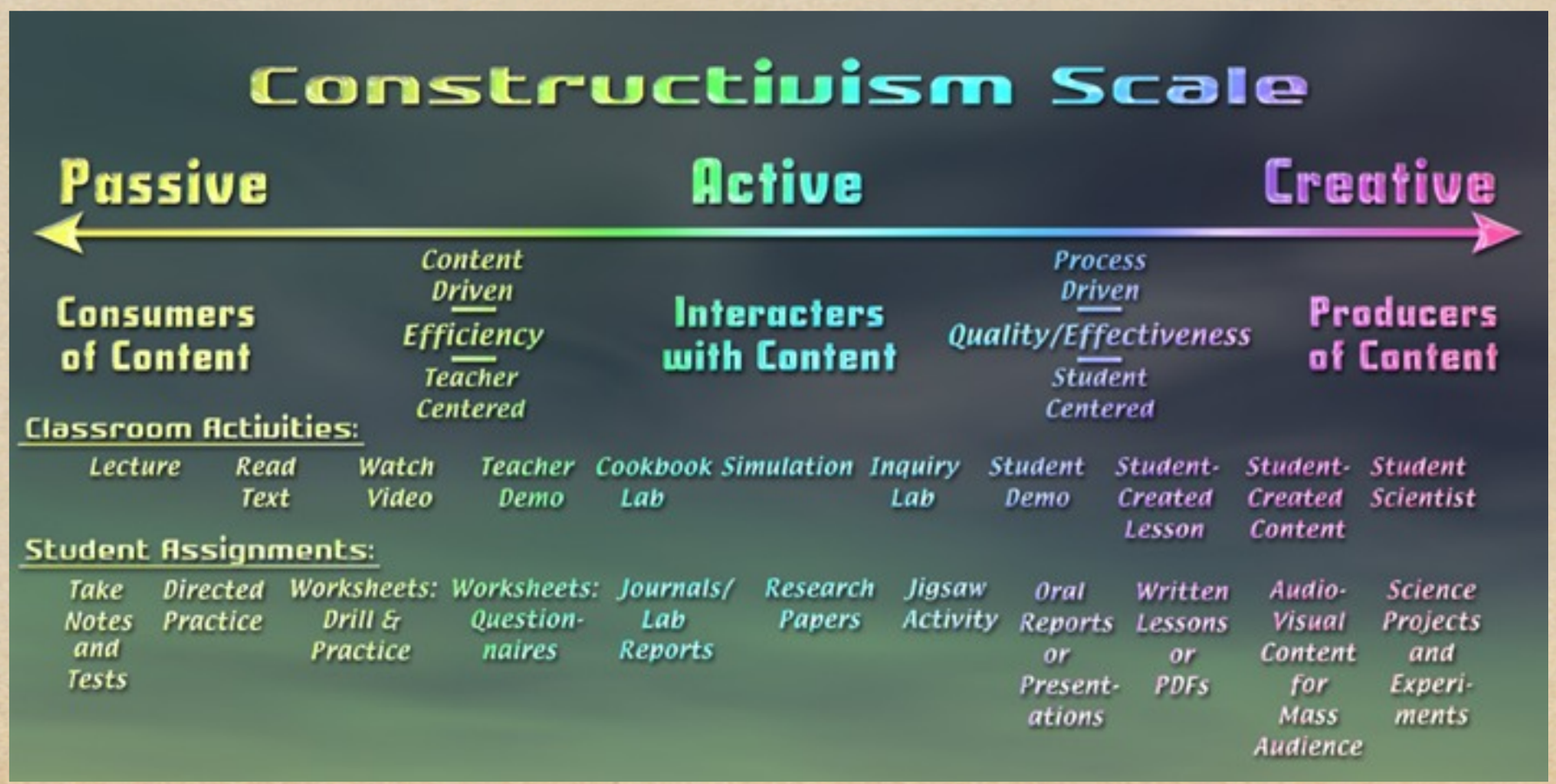


STEM Career Stats

Science & Engineering Degrees: 1966 - 2004

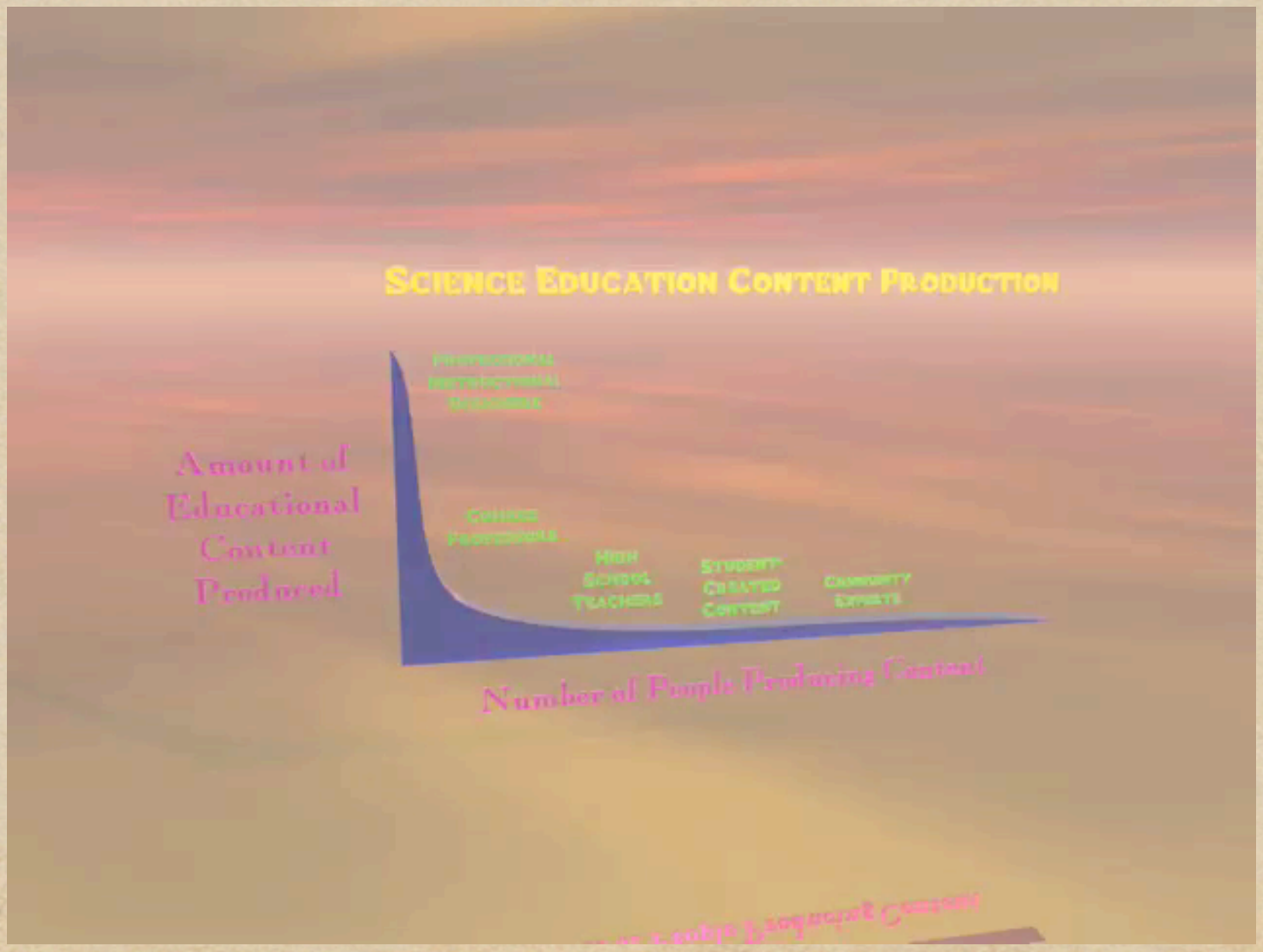
Project Rationale: Beyond Hands-On

- Value of student-created content
- Producers instead of consumers
- The Creative Student: student scientists



Project Rationale: Podcasting

The Long Tail of Science Education Content Creation



Project Rationale:
Globalization & the Economics of Abundance

- Ten forces that have flattened the world

  (Tom Friedman: The World is Flat)

- The digitization of everything
- Unbounded audience
- Information on-demand anywhere
- Web 2.0 technologies

How You Can Participate:

- Encourage science, history, and media students to form teams, with *you* as the mentor teacher. Find people to be Subject Matter experts.
- Collaborate on the Wiki site to evaluate the scripts and videos: elementsunearthed.pbwiki.com
- Visit our blog or the iTunes site, download the PDFs and videos, and use them in your classes: elementsunearthed.com
- Contact me at: dblack@mlatc.edu 801-787-0512