A photograph of the Golden Gate Bridge at night, illuminated against a dark blue sky. The bridge's towers and suspension cables are visible, extending from the left side of the frame towards the right.

Are 21st century skills found in science education standards?

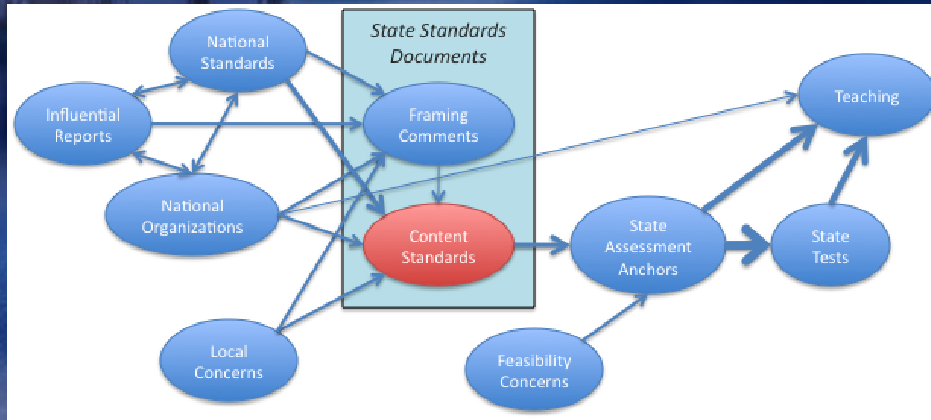
Christian Schunn
LRDC
University of Pittsburgh

A photograph of the Golden Gate Bridge at night, illuminated against a dark blue sky. The bridge's towers and suspension cables are visible, extending from the left side of the frame towards the right.

Overview

- w High-level overlap
- w Details
- w Recommendation

Theory of Action



National Science Education Standards, 1996

w 7 Content Categories:

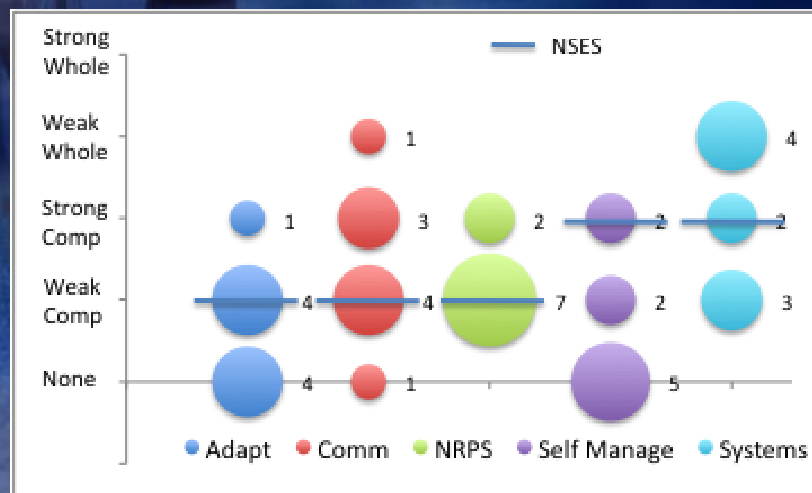
- w science as inquiry
 - w physical science
 - w life science
 - w earth and space science
 - w science and technology
 - w science in personal and social perspectives
 - w history and nature of science
- Common in state standards* {
- Relevant to 21st Century Skills* →

Note: More relevant -> Teaching standards

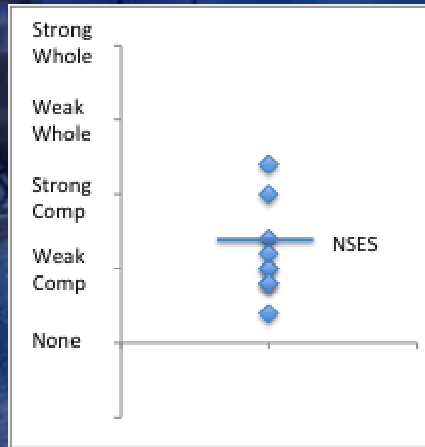
State Science Standards

- w Common core, but varying in detail and grade level
- w Large variability in what done with content (understand/know, solve problems, apply to context, or integrate with data)
- w Large variability in technological design (ignore, worry about consequences, actually do)

Overall Overlap By Skill



Overall Coverage By State



States examined:
Iowa, Kansas, Maine,
Massachusetts, New
Jersey, North
Carolina, South
Dakota, West
Virginia, and
Wisconsin

Adaptability

w ability and willingness to cope with uncertain, new, and rapidly-changing conditions on the job

w handling work stress

w adapting to different personalities, communication styles, and cultures

w physical adaptability to various indoor or outdoor work environments

A photograph of the Golden Gate Bridge in San Francisco, viewed from a low angle looking up at the towers and cables. The sky is a deep blue, and the bridge's structure is silhouetted against it.

Complex communication and Social Skills

- w Select key pieces of a complex idea to express in words, sounds, and images, in order to build shared understanding

- w Social perceptiveness

- w Persuasion

- w Negotiation

- w Instructing

- w Service orientation

A photograph of the Golden Gate Bridge in San Francisco, viewed from a low angle looking up at the towers and cables. The sky is a deep blue, and the bridge's structure is silhouetted against it.

Non-routine Problem Solving

- w narrow the information to reach a diagnosis of the problem

- w ability to reflect on whether a problem-solving strategy is working and switch to another strategy if the current strategy isn't working

- w creativity to generate new and innovative solutions

- w integrating seemingly unrelated information

- w recognize patterns not noticed by novices

- w knowledge of how the information is linked conceptually



Self Management

- w ability to work remotely , in virtual teams
- w work autonomously
- w self motivating
- w self monitoring
- w willingness and ability to acquire new information related to work
- w willingness and ability to acquire new skills related to work



Systems Thinking

wSystems analysis

- w Systems decision making
- w Structure-behavior-function
- w System control



Conclusions

- w Glass half-full
 - w National and some state standards provide a foundation for 21st Century Skills
- w But!
 - w Don't stop at superficial matches (devil is in the details)
- w Also:
 - w Standards ≠ learning