

Fusion Science Theater National Dissemination and Training Program



USING ELEMENTS OF STORY TO TEACH SCIENCE CONCEPTS

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AUDIENCES

Public Audience: Children grades 1-5, especially those in underrepresented demographics

Professional Audience: All ISE educators and volunteers who do science shows or presentations



Fusion Science Theater (FST) uses elements of story to craft demonstration shows that promote and assess conceptual learning.

ELEMENTS AND STRUCTURE OF A STORY

CHARACTER Status Quo	Dramatic Question motivates audience to process story to find out what happens	Revelations & Gaps requires audience to process evidence to fill in gaps	Physical Representation of ideas	Dramatic Question answered as PAY OFF
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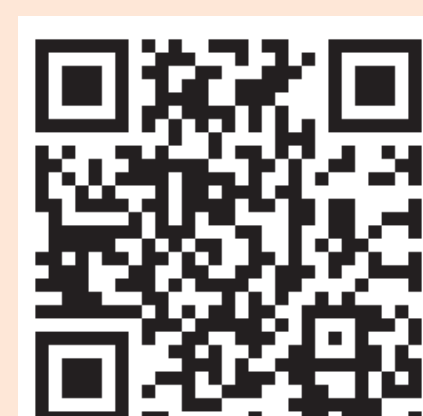
Audience must figure out MEANING of story to predict and make sense of answer to Dramatic Question

FUSION SCIENCE THEATER SHOW

Host characters introduce Investigation Question; Audience is real protagonist in learner-centered show	Investigation Question launches inquiry-based learning	Prediction engages children in learning and allows Pre-Lesson Assessment	Demonstrations provide evidence, illustrate concepts	Modeling: Physical Dramatizations involve children in kinesthetic model of show's main concept	Prediction invites application of concept learned and allows Post-lesson Assessment	Answer to Investigation Question revealed as PAYOFF

Children make connections, construct explanation, use explanation to predict answer the Investigation Question

This "story form" model has been used to design more than 8 successful FST shows



FST SHOW KITS

Kits available Fall 2014 from the Institute for Chemical Education.
<http://ice.chem.wisc.edu/FST.html>

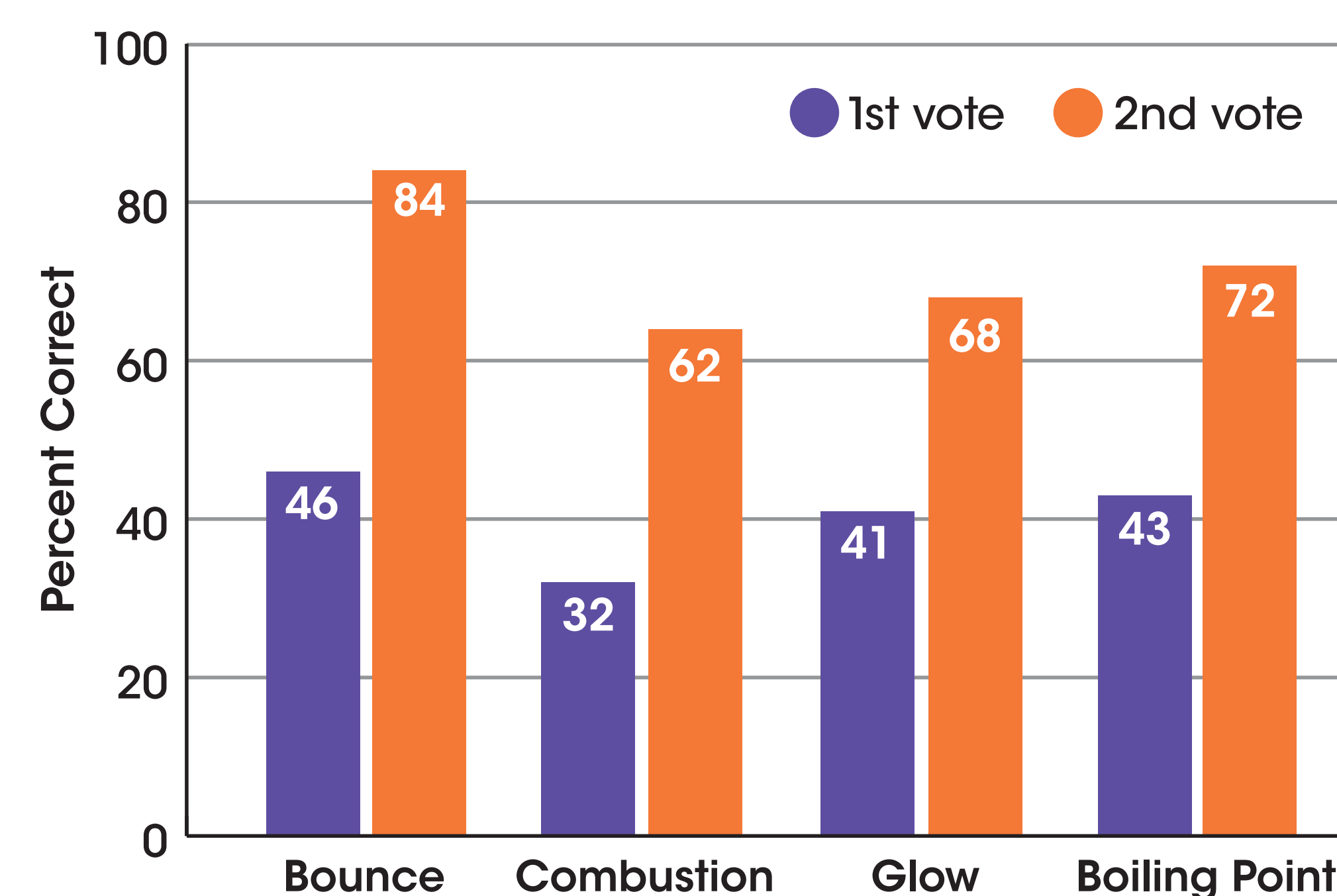
- **Will It Light?**
Concept: Conductivity of pure substances and solutions.
- **Bounceman and If I Were an Atom**
Concepts: Molecular structure determines polymer properties and Kinetic Molecular Theory



EVALUATION

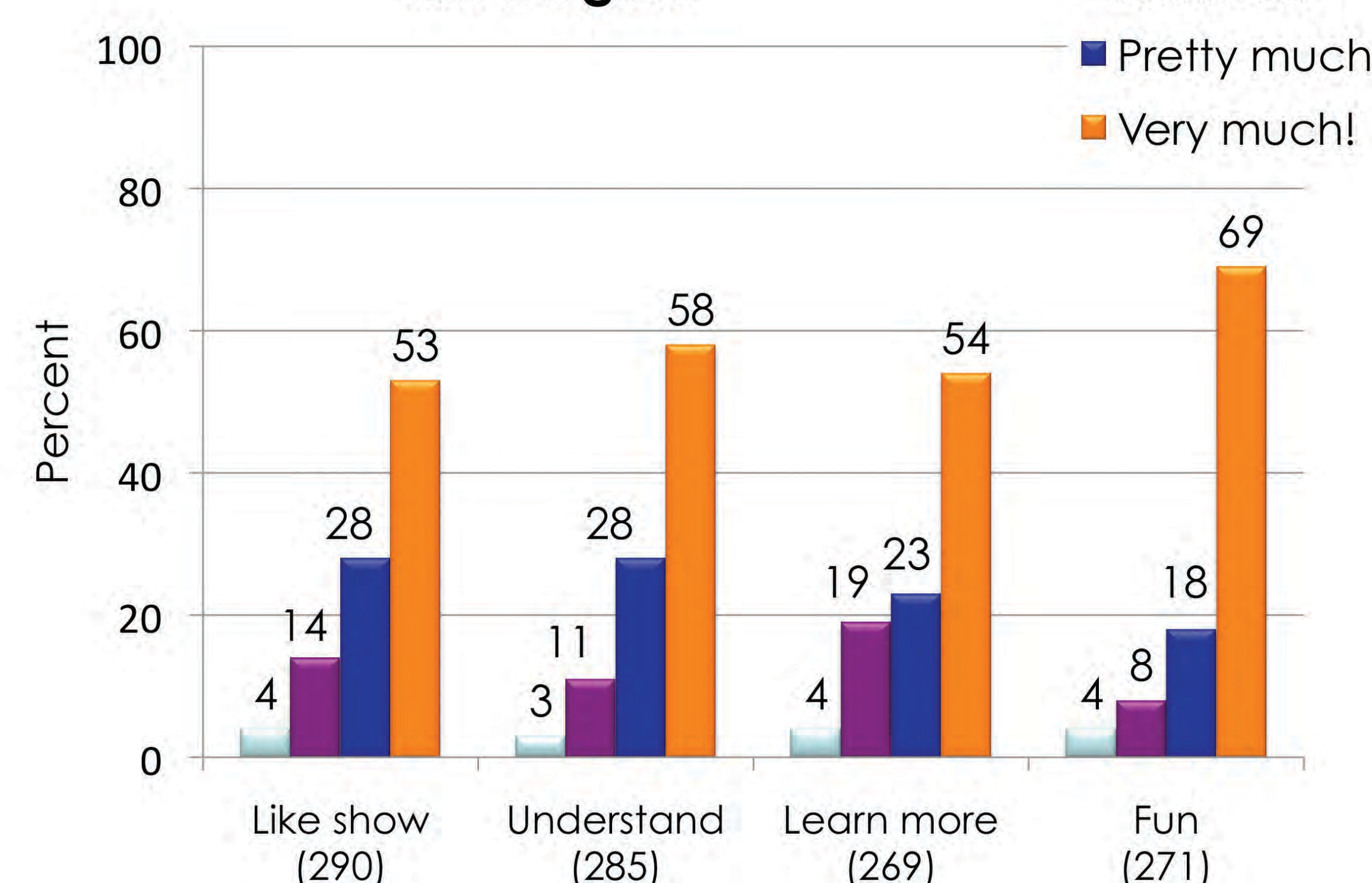
Cognitive impact is measured through the pre- and post-lesson Prediction. This embedded assessment demonstrates significant gains in children's understanding of the central concept of the show.

Learning from Fusion Science Learning Shows



Affective impact of the shows is evaluated by post-show questionnaire. FST shows produces significant gains in children's desire to learn science and belief that they can learn science.

Development: Children's Attitudes - "Will It Light?"



QUESTIONS

Can Professional Audience perform successful FST shows? **Answer: YES**

- Undergraduate groups affiliated with the American Chemical Society successfully performed FST shows after attending an FST Performance Training Workshop.
- Museum Outreach and Theater professionals performed successful FST shows from Script Kits.

Can Professional Audience use FST methods to design shows & activities that teach concepts and assess learning? **Answer: YES**

- Plenary and Keynote talks present theory and implementation of FST methods.
- FST Design Workshop allow participants to conceive, create, rehearse and perform a FST-like show in less than 24 hours.

Can FST methods be used to design hands-on activities? **Answer: YES**

- FST Activity KIT "Slime Design" will be produced by the American Chemical Society.

CHALLENGES

Need for research on:

- Cognitive impact of traditional demonstration shows
- How elements of story enhance learning

Need collaborators interested in research, innovation, and dissemination

**FUSION
SCIENCE
THEATER**

