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# ENGINEERING EMPOWERMENT: SCIENCE LITERACY THROUGH ENGINEERING DESIGN

Jennifer R. Keshwani

*University of Nebraska-Lincoln*, [jkeshwani@unl.edu](mailto:jkeshwani@unl.edu)

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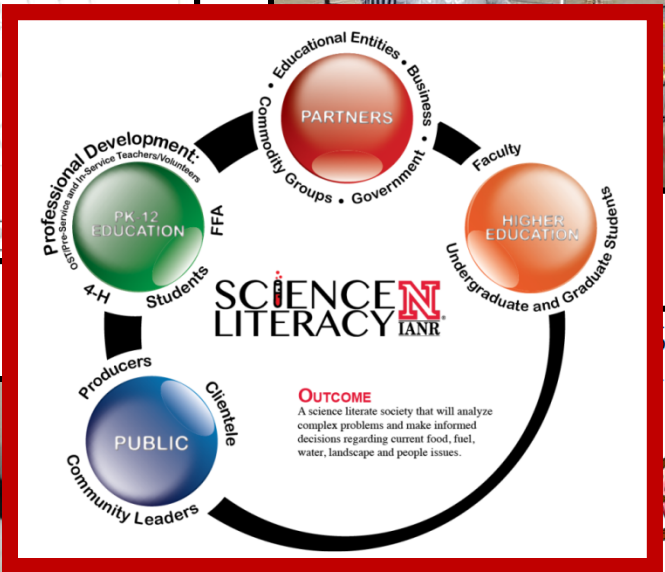
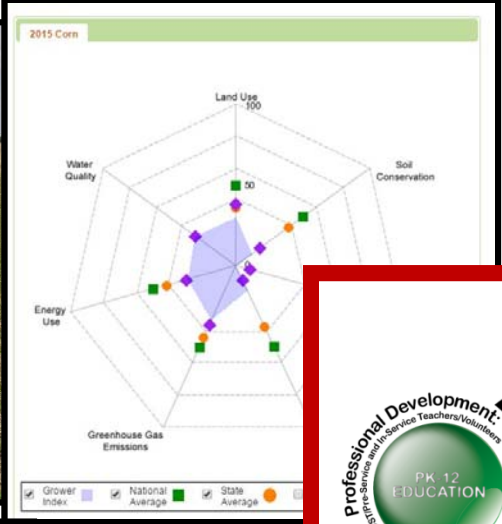


# ENGINEERING EMPOWERMENT: SCIENCE LITERACY THROUGH ENGINEERING DESIGN

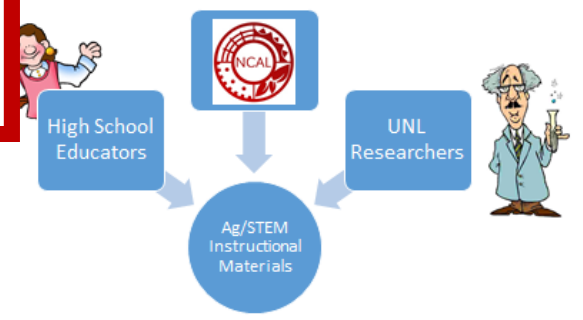
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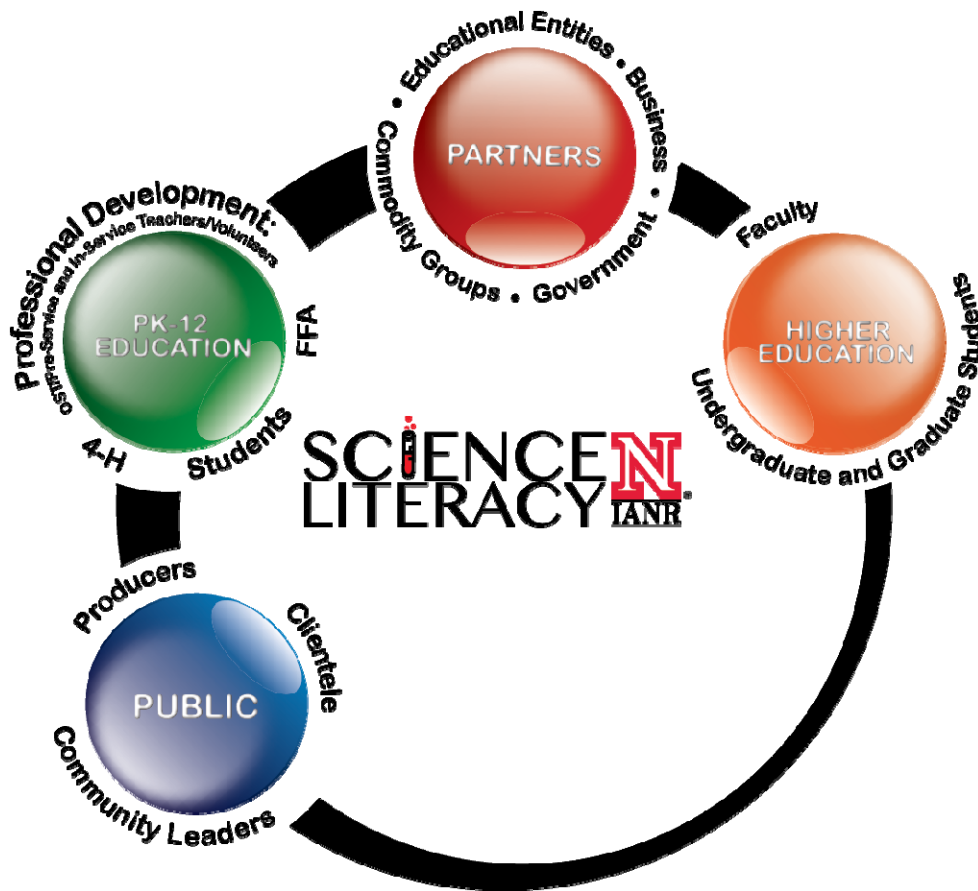


@DrJennyKeshwani



### Partners - Translating Applied STEM Research into Secondary Science





## Outcome

A scientifically literate society capable of making effective decisions grounded in STEM-informed analyses of complex, real-world challenges associated with food, fuel, water, landscape, and people issues.





# Finding Solutions for Life on a Small Planet

- Projected increase in world population by 2050 will add **2 billion** people to the planet
- Growing world population requires more food, water, energy, goods, medical technologies
- Limited resources demand we do more with less, without degrading our natural world



Produce future STEM professionals

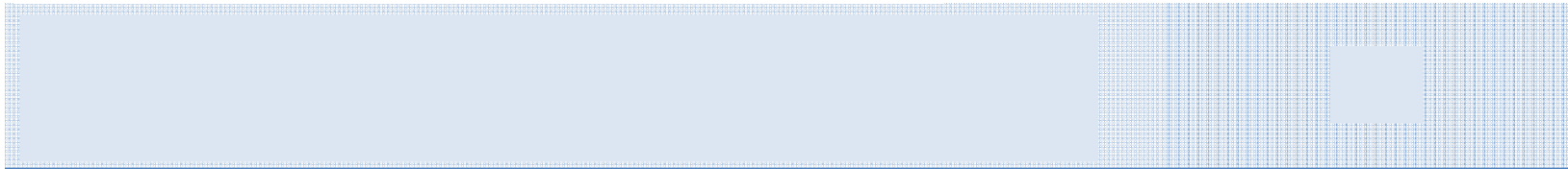
Develop a science and technology  
literate society



# CORRECT ANSWERS TO FACTUAL KNOWLEDGE QUESTIONS

**Question**

**% Correct Answers  
(US, 2010, n=1,932)**



## Science and Engineering Indicators 2012

SOURCES: United States—University of Chicago, National Opinion Research Center, General Social Survey (2010); South Korea—Korea Science Foundation (now Korea Foundation for the Advancement of Science and Creativity), Survey of Public Attitudes Toward and Understanding of Science and Technology (2004); EU—European Commission, Eurobarometer 224/Wave 63.1: Europeans, Science and Technology (2005), and Eurobarometer 224/Wave 64.3: Europeans and Biotechnology in 2005: Patterns and Trends (2006); Japan—National Institute of Science and Technology Policy/Ministry of Education, Culture, Sports, Science and Technology, Survey of Public Attitudes Toward and Understanding of Science and Technology in Japan (2001); Malaysia—Malaysian Science and Technology Information Centre/Ministry of Science, Technology and Innovation, Survey of the Public's Awareness of Science and Technology: Malaysia (2008); India—National Council of Applied Economic Research, National Science Survey (2004); China—Chinese Association for Science and Technology/China Research Institute for Science Popularization, Chinese National Survey of Public Scientific Literacy (2007); Russia—Gokhberg L and Shuvalova O, Russian Public Opinion of the Knowledge Economy: Science, Innovation, Information Technology and Education as Drivers of Economic Growth and Quality of Life, British Council, Russia (2004).



# What is Science?

- Merriam-Webster:  
*knowledge about or study of the natural world based on facts learned through experiments and observation*





# How to apply science...

The Washington Post



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The Volokh Conspiracy | Opinion

## New study confirms that 80 percent of Americans support labeling of foods containing DNA

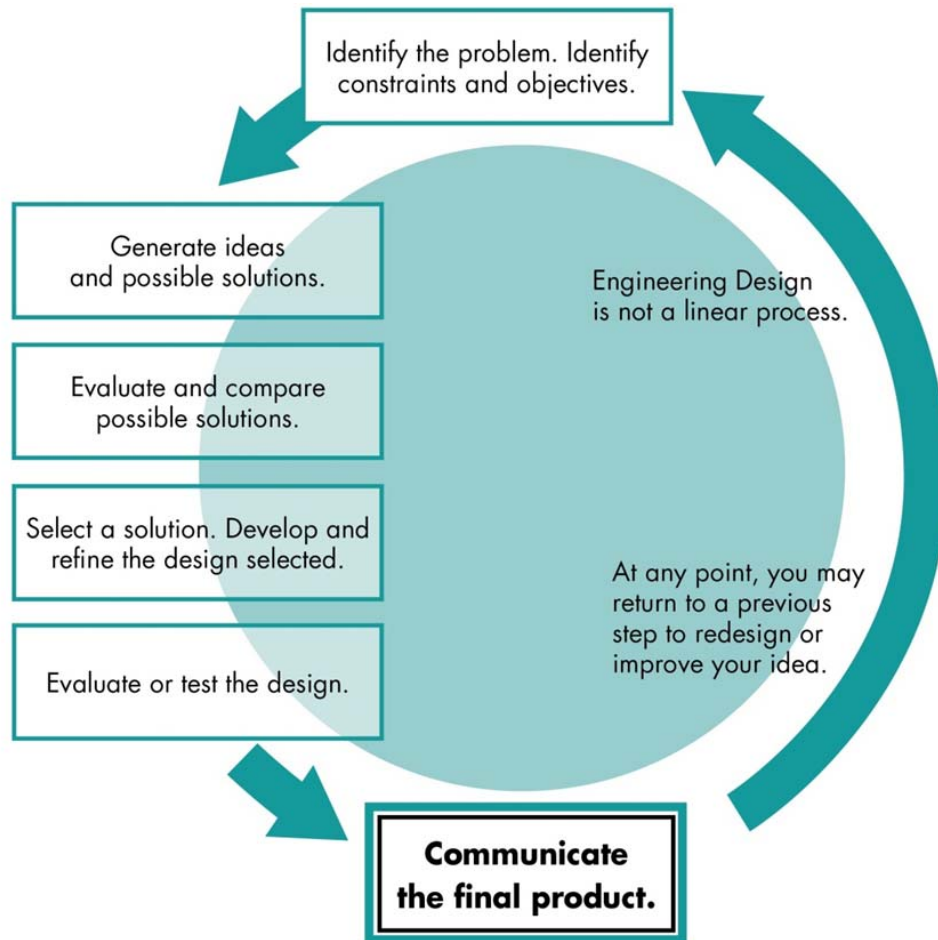
By Ilya Somin May 27



DNA.

Last year, I wrote about an Oklahoma State University survey indicating that over 80 percent of Americans support “mandatory labels on foods containing DNA.” A new study written by economists Brandon McFadden and Jayson Lusk (who also helped author the OSU survey) similarly finds that 80% of the public support labeling of foods containing DNA (though in this case the question does not clearly indicate whether the labeling should be mandatory or not). Katherine Mangu-Ward has some additional discussion of the

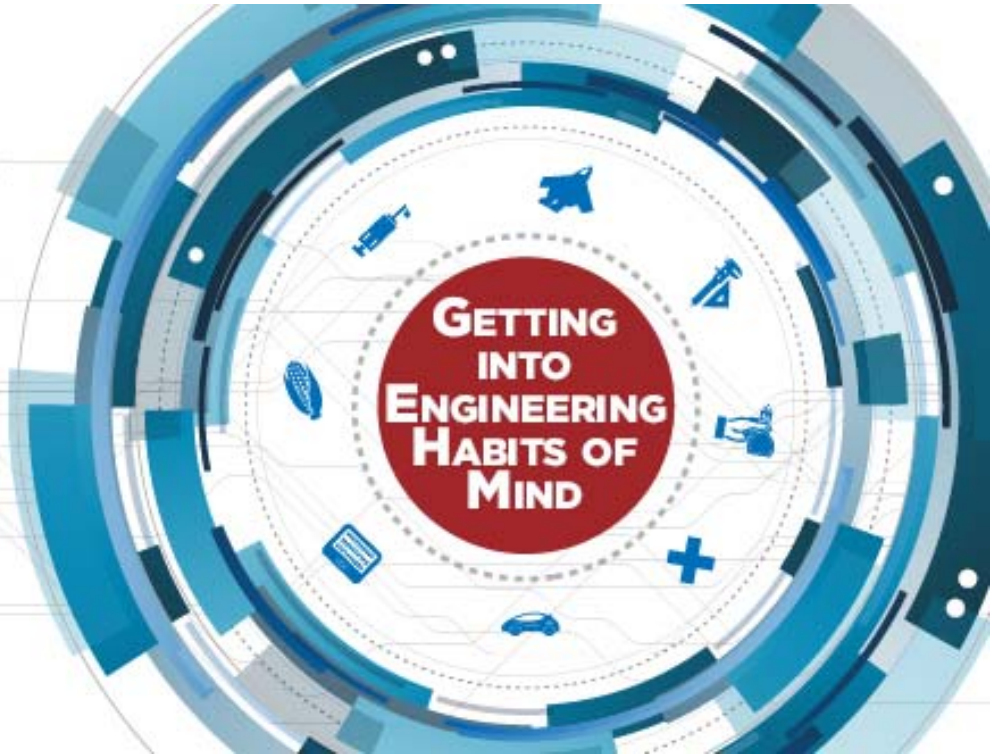
# ENGINEERING DESIGN PROCESS



- **Systems thinking**
- **Creativity**
- **Optimism**
- **Collaboration**
- **Communication**
- **Ethical Considerations**



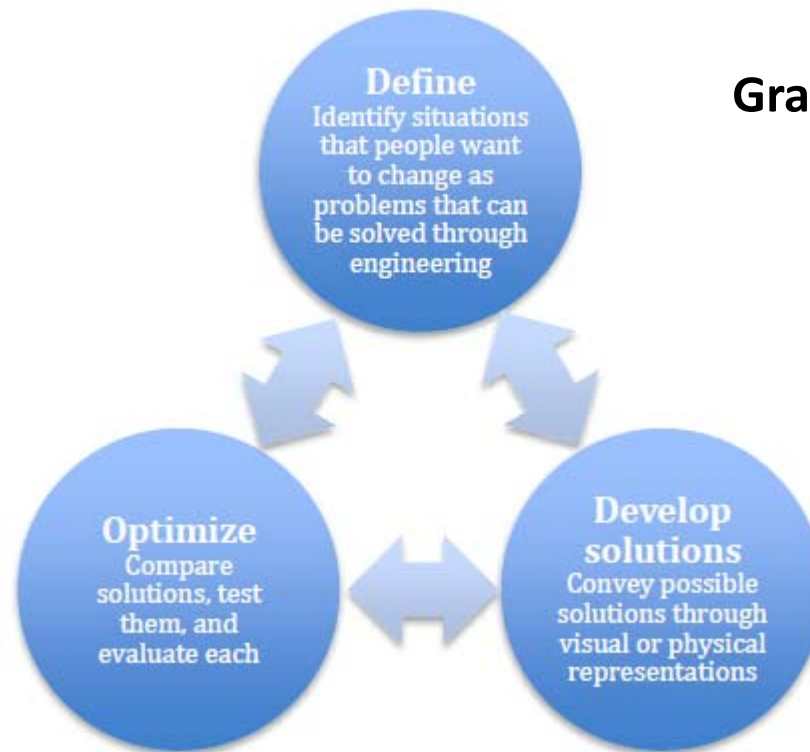
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IN K-12  
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TEACHERS  
WORKSHOP:



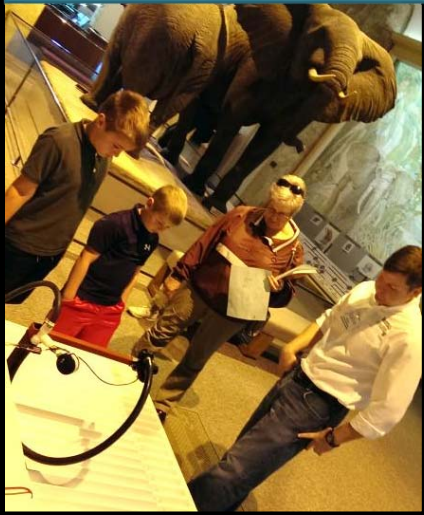
# K-12 ENGINEERING



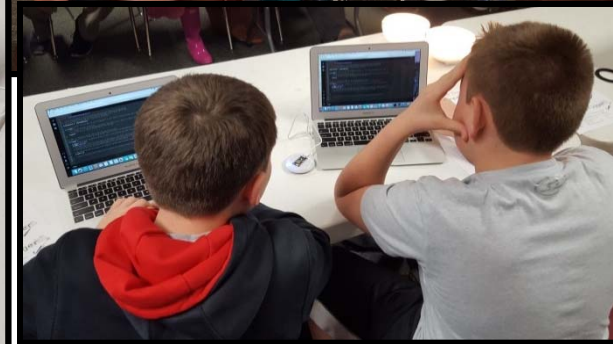
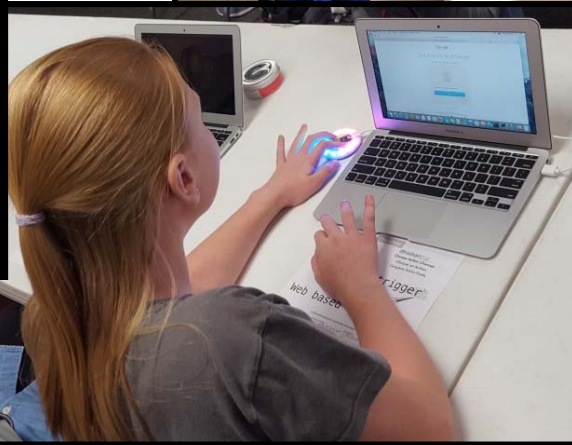
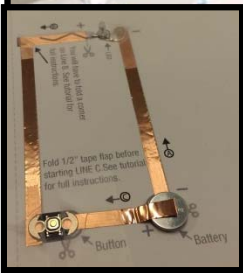
Grades K-2



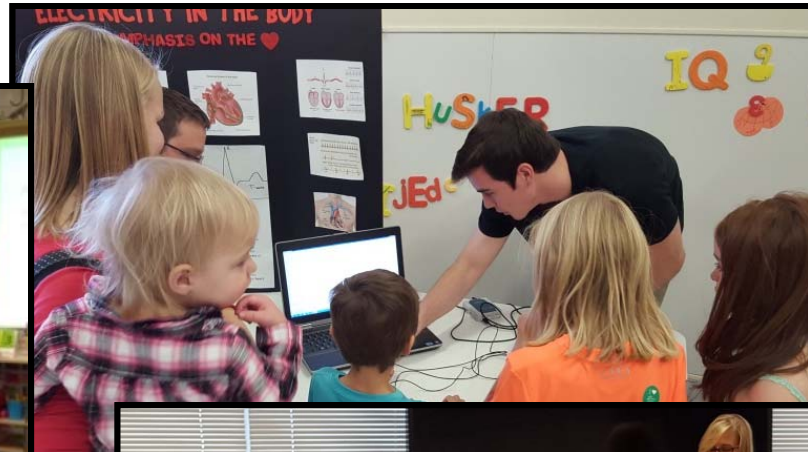
# Exposure to Engineering Design



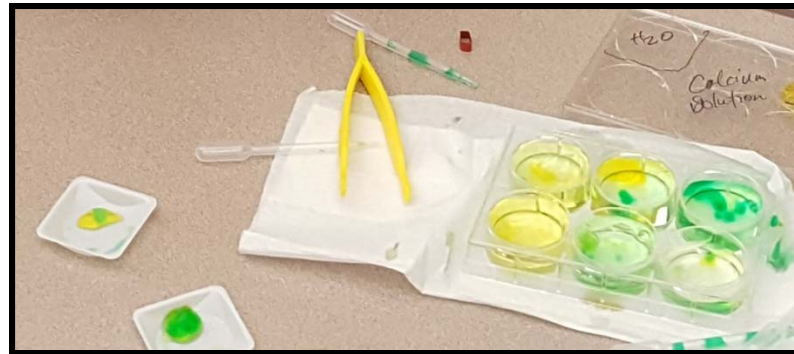
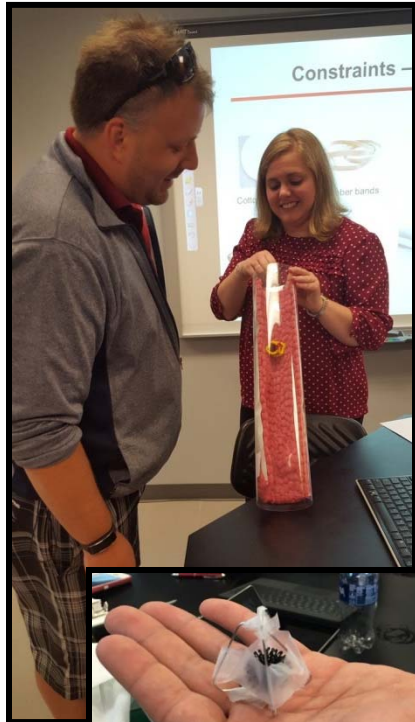
# K-12 Engineering Design Curricula



# Undergrad Teaching Experience



# K-12 Educator Professional Development



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# WHAT IS YOUR ROLE?

- What misconceptions do you hear in society related to your work?
- How do you respond?
- Are there opportunities for greater impact?





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