



LINKED LEARNING CONVENTION | ANAHEIM, CA | FEB. 12-14

# SOLVING REAL WORLD CHALLENGES: EXAMPLES OF HANDS-ON PROJECTS FOR THE LINKED LEARNING CLASSROOM



#LinkedLearning | #LLCON2018

# AGENDA

- Introduction of Panel and Panelists  
Joan Bissell, CSU Chancellor's Office
- Questions to Panelists
- Testing Insulation Materials for an Energy Efficient Home  
Participants
- Participant Share Out  
What were the benefits of the hands-on activities and project-based learning? Did they foster deeper learning about potential insulation materials?

# PANELISTS

- Stephanie Biagetti  
Professor of Mathematics Education, Sacramento State
- Stephen Glass  
Principal, West Covina High School
- Cynthia Bater and Tom Malkus  
Program Administrator and Consultant, Long Beach Unified School District
- Bob Capriles  
Math and Engineering Teacher, Fremont High School

# PANELIST QUESTIONS

- What do you see as the value of hands-on activities and project-based learning in advancing students' understanding of careers?
- What are the special roles and unique significance of hands-on activities and project-based learning within Linked Learning?

# TESTING INSULATION MATERIALS

- Tables will test different insulation materials to determine which would be most effective for home insulation
- Each table will use a chart from *Here Comes the Sun: Engineering Insulated Homes\** to record results
- Participants at each table will address a few reflective questions

*\*The activity is taken from The Museum of Science, Boston, Engineering is Everywhere (EiE) curriculum*

# WHAT DO WE KNOW ABOUT INSULATION?

- What types of insulation do you know about?
- What type of insulation do you have in your home?
- What ideas do you have about how we might test and compare different types of insulation?

# HOW DO WE CONDUCT OUR EXPERIMENT?

## Activity 2: Investigating Insulation

- What variables or parts of our experiment do you think might be important to control or keep the same?
- How far should the sun lamp be from the insulation?
- How long should insulation be under the sun lamp?
- How thick should the layer of insulation be?
- How often should we take temperature readings?
- Should we have a control? If so, how would we set it up and gather data on it?

# SELECT A FACILITATOR AND REPORTER

- Answer Reflective Questions for Investigating Insulation sheet
- The Reporter should address the questions from the Lab Notebook (Activity 2)
- The Facilitator enters responses to Reflective Questions
- The group selects one or two questions for report out



# CONDUCT OUR EXPERIMENT

- Prepare insulation for testing
- Timer to remind when to record data
- Begin the experiment
- When complete with one insulation type
  - One team member records data
  - Other team members are getting the second insulation ready

# EXPERIMENT REFLECTIVE QUESTIONS

- Which types of insulation worked best?
- Which types did not work as well?
- Do these findings give you any information on materials you did not have before?
- What would you include – or not include – in your final design?

# THE ENGINEERING DESIGN PROCESS

- Eight-step process in solving engineering challenges
  1. *Identifying* a problem
  2. *Investigating* what has already been done
  3. *Imagine* different solutions
  4. *Plan* designs
  5. *Create* designs
  6. *Test* designs
  7. Make *improvements* based on test results
  8. *Communicate* findings to others



# CHOOSE A FEW QUESTIONS FOR SHARE OUT

- The Engineering Design Process (EDP)
  - What steps in the EDP were used by the group?
  - How can the EDP be used in solving other problems?
  - How does the EDP enhance students' understanding?
- Benefits of hands-on and project-based learning (PBL)
  - How does PBL encourage innovation and creativity?
  - Why are hands-on learning and PBL engaging to students?
  - What open-ended question might you ask students to encourage innovative thinking?

# PRESENTER CONTACT INFORMATION

- Cynthia Bater: [cbater@lbusd.net](mailto:cbater@lbusd.net)
- Stephanie Biagetti: [sbiagetti@csus.edu](mailto:sbiagetti@csus.edu)
- Joan Bissell: [jbissell@calstate.edu](mailto:jbissell@calstate.edu)
- Bob Capriles: [bob\\_capriles@fuhsd.org](mailto:bob_capriles@fuhsd.org)
- Stephen Glass: [sglass@wcusd.org](mailto:sglass@wcusd.org)
- Tom Malkus: [tmalkus@lbusd.net](mailto:tmalkus@lbusd.net)



LINKED LEARNING CONVENTION | ANAHEIM, CA | FEB. 12-14

# Thank you!

[Linkedlearning.org](https://linkedlearning.org)