### Laboratory Activities for Broadened Scientific Inquiry (LABScI) Teaching Science Labs to Patients in Pediatric Hospital Schools

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### Why teach science labs?

- Fundamentals of scientific theory
- Address key scientific concepts
- Teach process of quantitative lab measurements
- Integrated and cross-disciplinary concepts
- Help students stay on track in science topics







# **Hospital Challenges**



### **Patient Restrictions**

- Mobility challenges for patients
- Patients in isolation rooms
- Patients recovering or in exhausting treatment



### **Restrictions on Laboratory Materials**

# NO:

- Biological Materials
- Sharps (Needles, Knives)
- Chemicals
- Open Flames



### **Educational Barriers**



- Differential levels of previous classroom education and interest
- Lack of instructor knowledge
- Lack of resources to conduct labs
- Interrupted learning due to medical conditions



### WWW.LABSCI.STANFORD.EDU

### **Content Covered**

Labs fulfill the California State Board of Education's Content Standards (K-12)

### **Biology Labs** Chemistry Labs

•Cell Biology •Genetics •Ecology

- •Evolution
- •Physiology

- •Atomic & Molecular Structure
- •Chemical Bonds
- •Conservation of Matter & Stoichiometry
- •Gases
- •Acids & Bases
- •Solutions
- •Chemical Thermodynamics
- •Reaction Rates
- •Chemical Equilibrium
- •Organic Chemistry and
- Biochemistry
- •Nuclear Processes

### **Physics Labs**

•Motions & Forces •Conservation of Energy & Momentum •Heat & Thermodynamics •Waves •Electric and Magnetic Phenomena

*Integrative* Labs Under Development

Design ٠ Thinking

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- Rube Goldberg ٠ Simple **Machines** 
  - Disease Transmission & Immunology
- **Earth Sciences** ٠

# **Long-Term Program Goals**

- Sustainability of labs and lessons
- Adjustable content for grades 5-12
- Adaptable for one-on-one learning environment or full classroom
- Suitable for hospital, home school, or other educational settings
- Teachable by individual of any educational background
- OPEN ACCESS TO EDUCATION

# Who wants to build some rollercoasters?



### Some Participating Hospitals & Programs

- Lucile Packard Children's Hospital School (Stanford, CA)
- Legacy Emanuel Children's Hospital (Portland, OR)
- Nationwide Children's Hospital (Columbus, OH)
- Sanford Children's Hospital (Sioux Falls, SD)
- St. Luke's Children's Hospital (Boise, ID)
- Durham Public School's Hospital School at Duke (Durham, NC)

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- Program in Human Biology

# **Thanks for listening!**

## Questions? Ideas? Interested in using LABScI content?

Please contact me at: nhdalal@stanford.edu

I would love to hear from you!