## Making Existing Technology Work
(Or Work Better)

- Troubleshooting
- Characterizing
- Optimizing & Improving
- Maintaining & Operating
- Calibrating

## Creating / Selecting New Technology

- Analyzing Tradeoffs
- Clarifying the Problem or Need
- Researching Other Solutions
- Brainstorming Solutions
- Prototyping
- Simulating
- Designing Within Requirements
- Breaking the Problem Down
- Considering "Good Enough" or "80%" Solutions

**CRITICAL ENGINEERING TECHNOLOGY SKILLS & EXPERIENCES**

## Communication

- Communicating Work Informally
- Presenting Formally
- Documenting Work for Self and Team
- Writing for Publication and Presentation

## Managing Technology Projects

- Planning
- Estimating Effort & Time
- Recognizing Resources
- Project Management
- Considering Cost Constraints
- Breaking the Problem Down
- Considering "Good Enough" or "80%" Solutions
- Prioritizing

**ENGINEERS' PROFESSIONAL SKILLS**

## Analyzing Technology as Systems

- Systems Thinking
- Understanding / Considering Protocols, Interfaces, & Standards
- Understanding / Considering Processes & Procedures
- Considering Controls

## Other Critical Thinking Skills

- Lateral Thinking
- Estimation (Back-of-the-Envelope and Order-of-Magnitude)

**ENGINEERS' WAYS-OF-THINKING**

# Valued Hawaii STEM Workforce Skills

[S&H 2010] Seagroves, S., & Hunter, L., 2010. "An Engineering Technology Skills Framework that Reflects Workforce Needs on Maui and the Big Island of Hawai'i" in Learning from Inquiry in Practice, L. Hunter & A.J. Metevier, eds, Astronomical Society of the Pacific vol. 436 p. 434.

Walker, B. (2013). Valued Hawaii STEM Workforce Skills [graphic]. Institute for Scientist & Engineer Educators, UC Santa Cruz.