



**This workforce solution was funded by a grant awarded under Workforce Innovation in Regional Economic Development (WIRED) as implemented by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership. This solution is copyrighted by the institution that created it. Internal use by an organization and/or personal use by an individual for non-commercial purposes is permissible. All other uses require the prior authorization of the copyright owner.**



# California Space Education & Workforce Institute

**Fostering California Space/Science Literacy**

**Enhancing California Space-Related Education K-University**

**Ensuring 21st Century California Space Workforce**

**Overview of STEM Collaborative Action Plan (STEMCAP)  
WIRED Grant Project**

**for STEMCAP Working Group Forum**

**December 9, 2006**

***Presented by: Deborah D. Hirsh, Executive Director***

# STEMCAP Project Goal

***“Develop a collaboration and a strategic action plan to increase the number and support the development of science, technology, engineering and math (STEM) students, graduates, teachers, professors and mentors within the California Innovation Corridor and the State of California, leveraging the resources and efforts not only of education and academia (K-20, public and private), but of industry and the informal science network”***

# Participants

## ***WIRED Grant Partners:***

- ❑ California State Polytechnic University, San Luis Obispo
- ❑ El Camino College
- ❑ California Council on Science and Technology (CCST)
- ❑ Mathematics, Engineering and Science Achievement (MESA-UC President's Office)
- ❑ Strategic Vitality, LLC
- ❑ California Space Education and Workforce Institute (CSEWI)

## ***+ Collaborators:***

- ❑ California State University (CSU) Chancellor's Office (Teacher Education Office/Public Schools Program Office)
- ❑ California Community College Chancellor's Office
- ❑ University of California (UC) President's Office

# Additional Participants

- ❑ Discovery Science Center
- ❑ American Institute of Aeronautics and Astronautics (AIAA)
- ❑ California Manufacturing and Technology Assn (CMTA)
- ❑ California Science Teachers Association
- ❑ California Math Council
- ❑ Cal TAC
- ❑ Director Strategic Communications and Development NASA  
Ames Research Center
- ❑ ARCHES
- ❑ California Department of Education
- ❑ California Math and Science Teachers Presidential Awardees
- ❑ Lockheed Martin Inc.

# Three-Year STEM Project Overview

## Year One:

- Organize
  - Preliminary Partnership Forum June 28
  - Steering Committee Oct 5
  - Determine Elements for STEMCAP
  - Align with Working Groups and begin work December 9, 2006
    - STEM inventory

## Year Two:

- Develop Plan through Working Group Forums
  - Preliminary Partnership Forum June 28

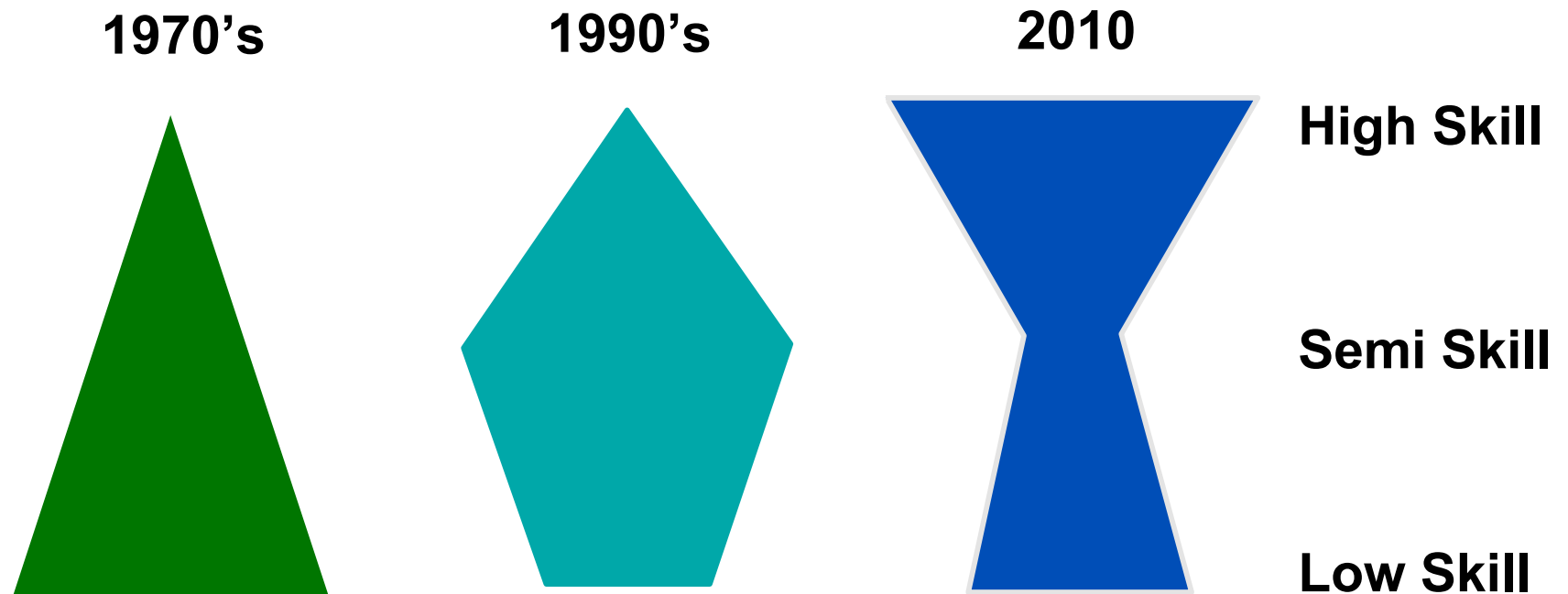
## Year Three:

- Approve Plan and Execute Outreach Plan

# The Labor Challenge

- ❑ Jobs requiring science, engineering and technical training will increase 51% nationally through 2008, leading to 6 million potential job openings for scientists, engineers, and technicians.
- ❑ In CA, fewer than 20,000 STEM graduates are produced annually.
- ❑ To make up for the shortfall, the number of such degrees produced in the state would need to increase by nearly 70%

# The World of Work has Changed



Source: Rick Stephens- Boeing

# A Global Shared Challenge

*“We are attempting to educate students (hire employees) today so that they will be ready to solve future problems that have not yet been identified using technologies not yet invented based on scientific knowledge not yet discovered.”*

**Joseph Lagowski**

**University of Texas at Austin**

Source: Rick Stephens - Boeing

# The Academic Challenge

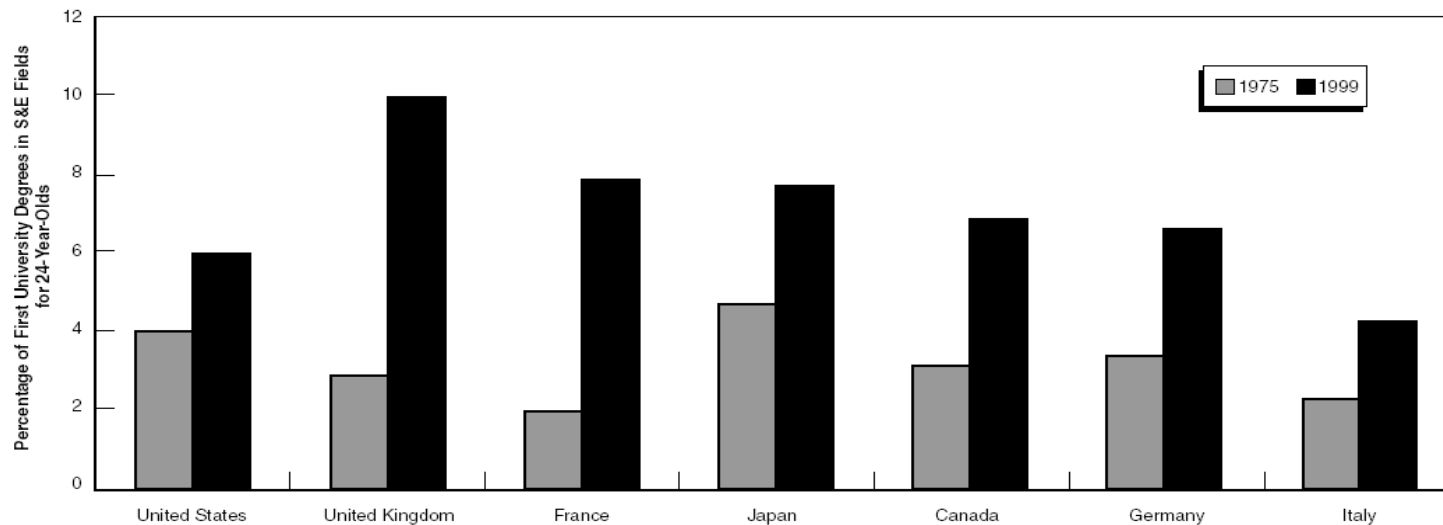
- ❑ The number of engineering degrees awarded in the U.S. in 2005 was down 20% from the peak year of 1985. From 2003 to 2004, the number of engineering doctorates dropped 22%.
- ❑ Out of 1.1 million high school seniors in the U.S. who took a college entrance exam in 2002, just under 6% indicated plans to pursue a degree in engineering.
- ❑ Nearly a 33% decrease in interest from the previous decade.

# In the Future Everyone Must:

- Have the ability to **define problems**
- Are able to **assimilate relevant data**
- Can **conceptualize** information and reorganize it
- Make **inductive and deductive leaps** with it
- Ask **hard questions**
- **Discuss findings** with colleagues
- **Work collaboratively** to find solutions
- **Convince others** of their position

# US and its Competitors: Science & Engineering Degrees

**A YOUNG ADULT'S PROBABILITY OF GETTING AN S&E DEGREE HAS RISEN MUCH LESS IN THE UNITED STATES THAN ABROAD**



Source: *Science and Engineering Indicators* (2002).

*Figure 3. Ratio of Natural Science and Engineering First University Degrees Awarded to 24-Year-Old Population, by Country, 1975 and 1999* (Rand study, 2003)

**The US graduates proportionately fewer science & engineering BS students than its international competitors**

# The K-12 Challenge in California

- **989 School Districts**
- **9171 Schools**
- **6,410,000 Students**
- **1000's of Businesses Want to Help**
  - **They all have their program(s)**
- **100's of Professional Societies Want to Help**
  - **They all have their program(s)**

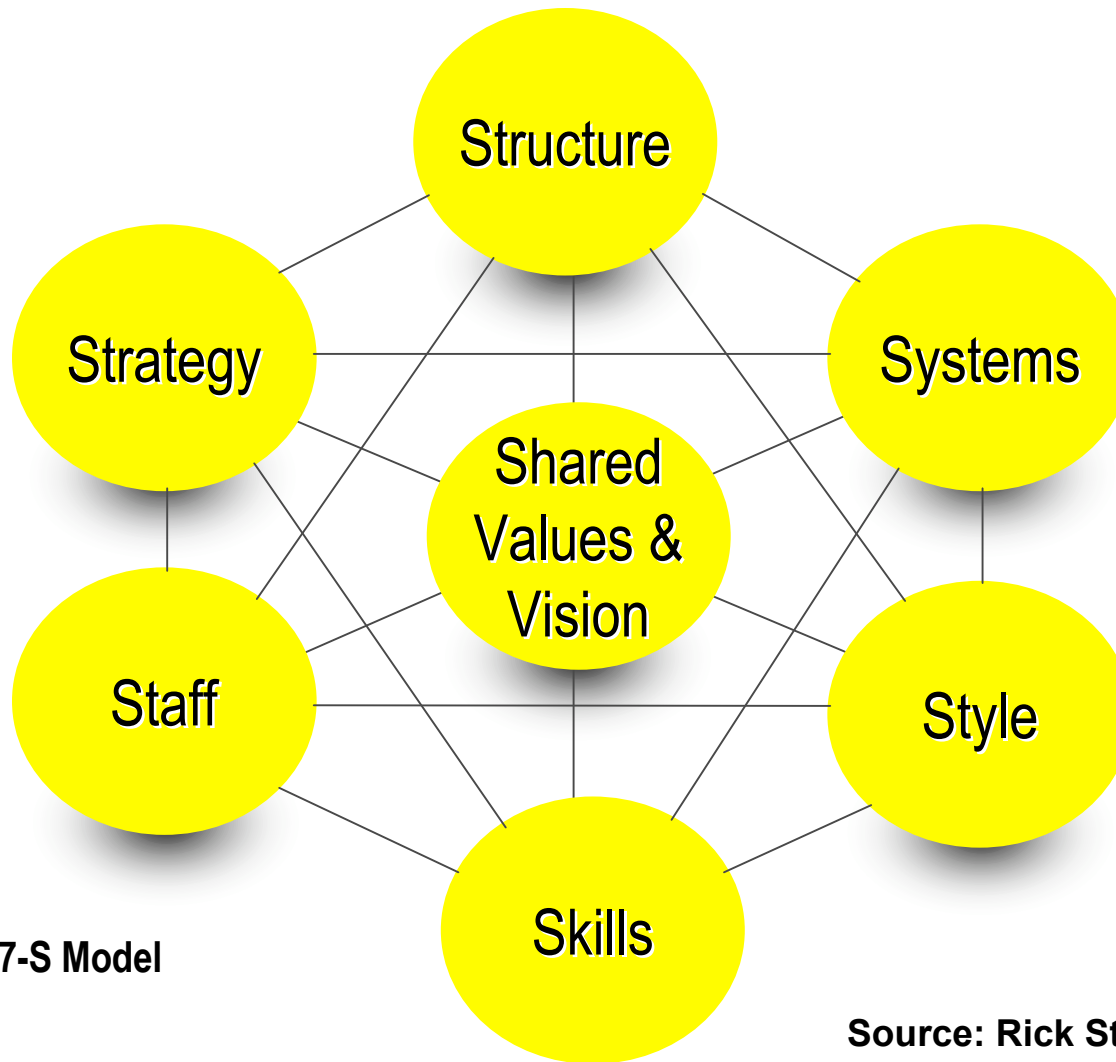
# Everyone Trying to Solve Their View of the Problem With Their Program or Their Position



# 40+ Informal Science Learning Centers

- Ag Science Center
- Bay Area Discovery Museum
- Birch Aquarium at Scripps
- CA Academy of Sciences
- CA Science Center
- Castle Science and Technology Center
- Chabot Space & Science Center
- Children's Discovery Center of San Jose
- Children's Museum of La Habra
- Columbia Memorial Space Science Learning Center
- Coyote Point Museum for Environmental Education
- The Discovery Center for S&T
- Discovery Museum, Sacramento Museum of History, Science, Space & Technology
- Discovery Science Center
- Downey Planetarium
- The Exploratorium
- Explorit Science Center
- Fresno Metropolitan Museum of Art, History and Science
- Hall of Health
- Happy Hollow Park & Zoo
- Humbolt State Univ. National History Museum
- Huntington Botanical Gardens
- Jet Propulsion Laboratory
- Kern County Museum
- Kidspace Children's Museum
- Lawrence Hall of Science
- LLNL – Discovery Center
- Lindsay Wildlife Museum
- Natural History Museum of Los Angeles County
- Palo Alto Junior Museum and Zoo
- Randall Museum
- Reuben H. Fleet Science Center
- San Diego Natural History Museum
- Santa Barbara Museum of Natural History
- The Tech Museum of Innovation
- Turtle Bay Exploration Park
- U.S. Army Corps of Engineers – Bay Model Visitor Center
- World of Wonders Science Museum
- Zeum

# Key Elements Requiring Alignment

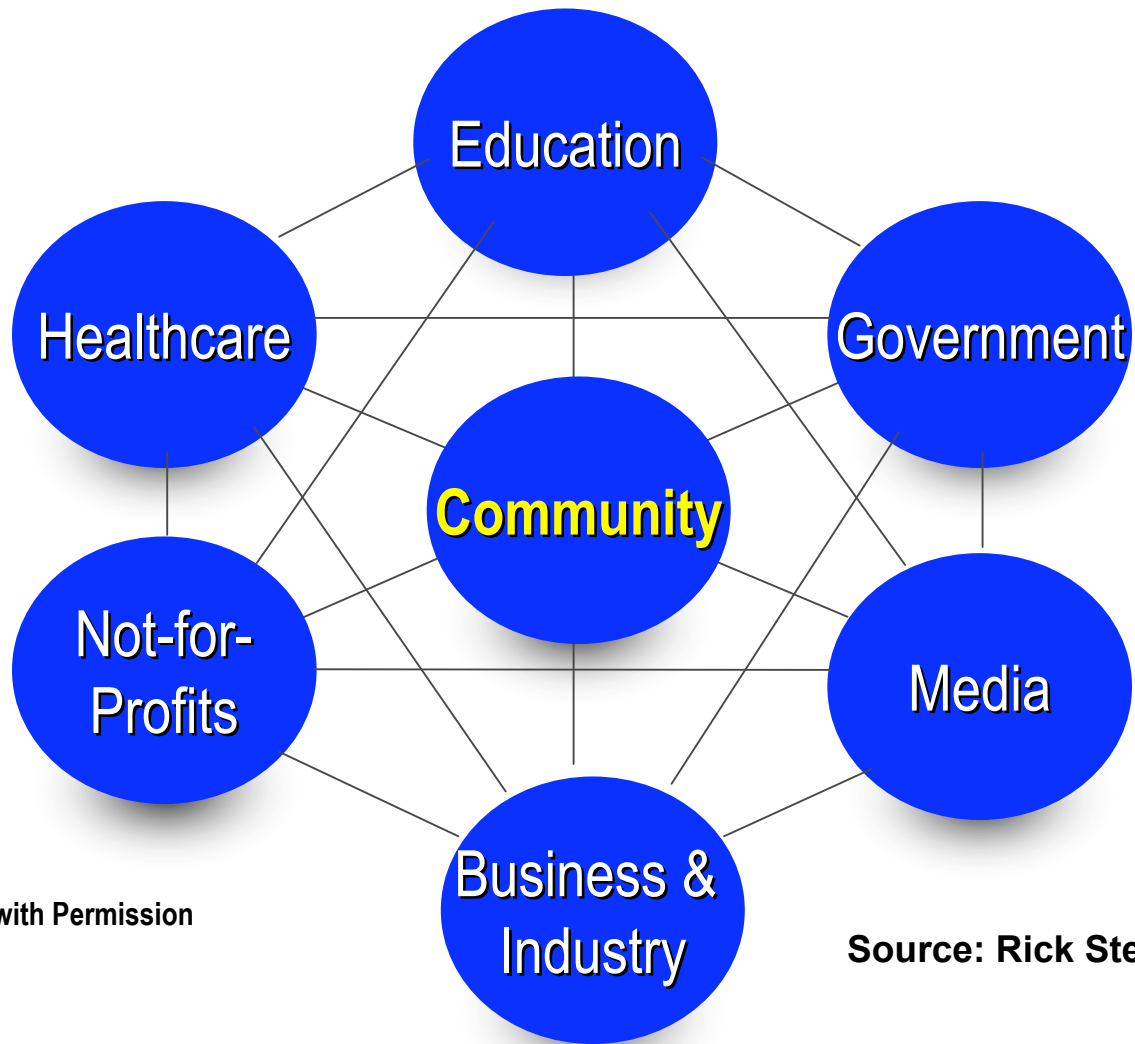


Based on McKinsey 7-S Model

12/19/06

Source: Rick Stephens - Boeing

# The Solution: Integrated Community Stakeholder Development



McKinsey 7-S Model Used with Permission

Source: Rick Stephens - Boeing

# What Does This Mean For Us?

- Think Differently
  - First as an individual
  - Second as a member of the “stakeholder groups” you are a part of
- This isn't someone else's problem
- This isn't just about fixing education
- This is not about teaming, this is about commitment to an integrated set of actions
- First work the plan, then the work the resources

***We must operate as an integrated system***

# Going Forward

1. Identify what is already out there and working
2. Leverage, leverage, leverage
3. Identify and attract stakeholder community leaders
4. Agree on common language and set of shared values
5. Agree on a shared vision and measures of success
6. Establish a plan including the stakeholder roles and responsibilities and the relationships or interfaces between stakeholders
7. Agree on the resources, and source of those resources, to achieve the shared vision
8. Think inter-segmentally – think systems approach

# STEMCAP Working Groups

Purpose: CIC STEM strategy input to Steering Committee

To leverage collective and institutional knowledge of CA diverse STEM stakeholders – public and private.

Group composition: cross-sector, cross-disciplinary, inter-segmental:

Three Groups:

- Recruitment
- Curriculum
- Transitions

# STEMCAP Working Groups-cont

Today's objective:

1. Goal statements for each group
2. Key elements to include in STEMCAP
3. Systemic approach – cross-sector, integrated strategic
4. Principles to use in evaluating programs
5. Energize and inform STEMCAP development process
6. Seek ongoing STEMCAP working group commitment