

The background of the slide features the official seal of the California Department of Education. The seal is circular, with a blue outer ring containing the text "DEPARTMENT OF EDUCATION" at the top and "STATE OF CALIFORNIA" at the bottom, separated by two white stars. The center of the seal depicts a golden oil lamp with a flame, resting on a stack of three books. Behind the lamp is a large, stylized sunburst. To the right of the books is a quill pen in a small grey holder. A ruler and a pencil are also visible at the bottom of the central illustration.

# ***Why Computer Science Matters to English Learners***

Gary Page  
Education Programs Consultant  
California Department of Education

# Thank You

- 1) Today's Economy and High Paying Jobs
- 2) Access to Knowledge and Skills
- 3) Challenges and Opportunities for Change
- 4) Solutions and Resources for YOU

Access to information and reports discussed in this workshop can be found at:

<http://www.edsynergy.org/workshop-materials.htm>

# The Golden State!



# Pony Express Mail





# St. Joseph to Sacramento



# Wells Fargo & Company



# California State Railroad Museum

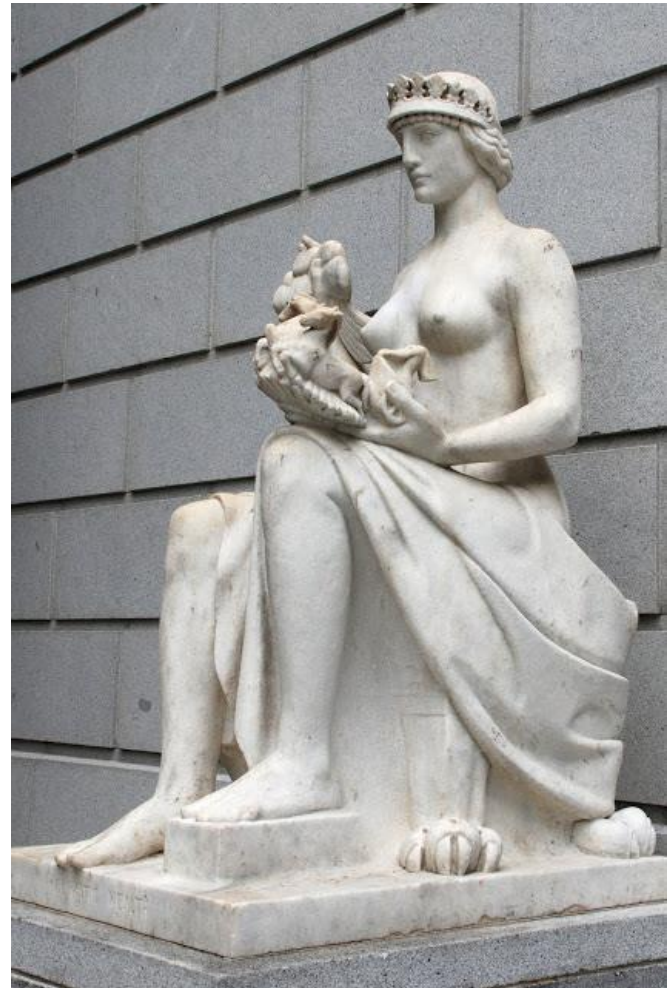




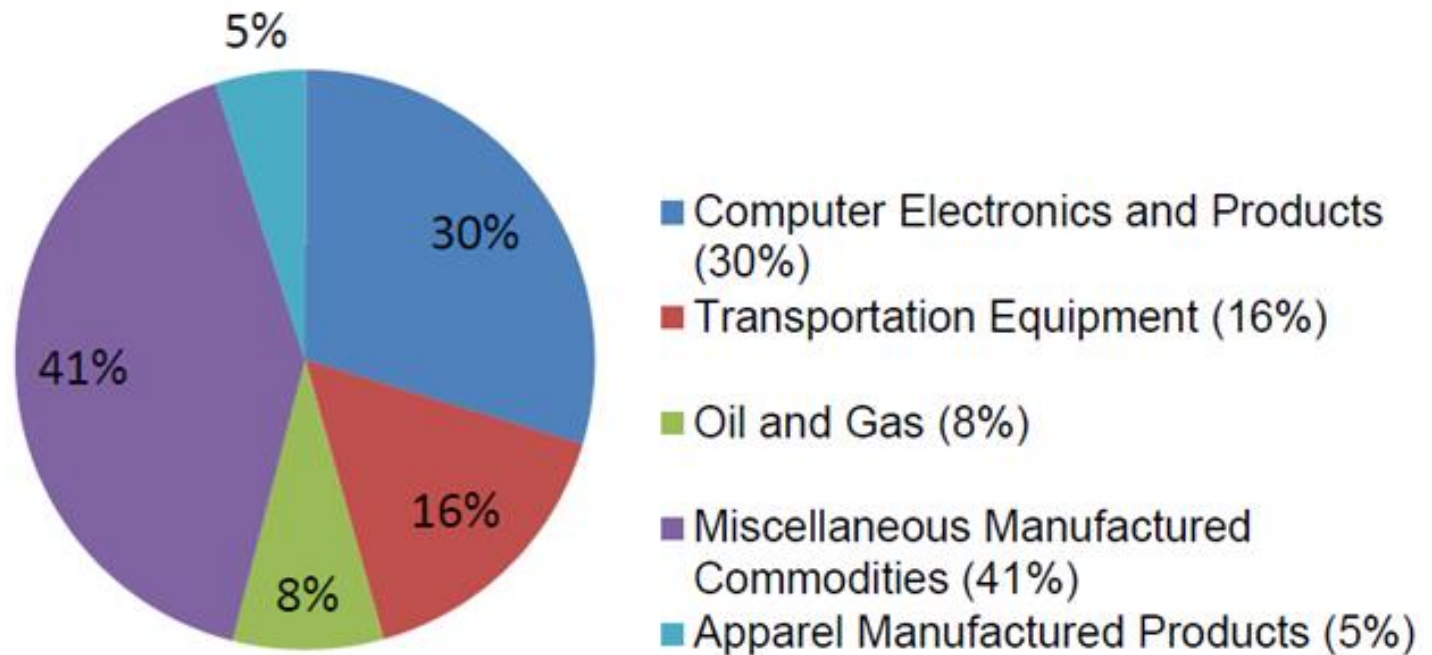
# Floral and Romantic Wealth



# Climatic and Mineral Wealth

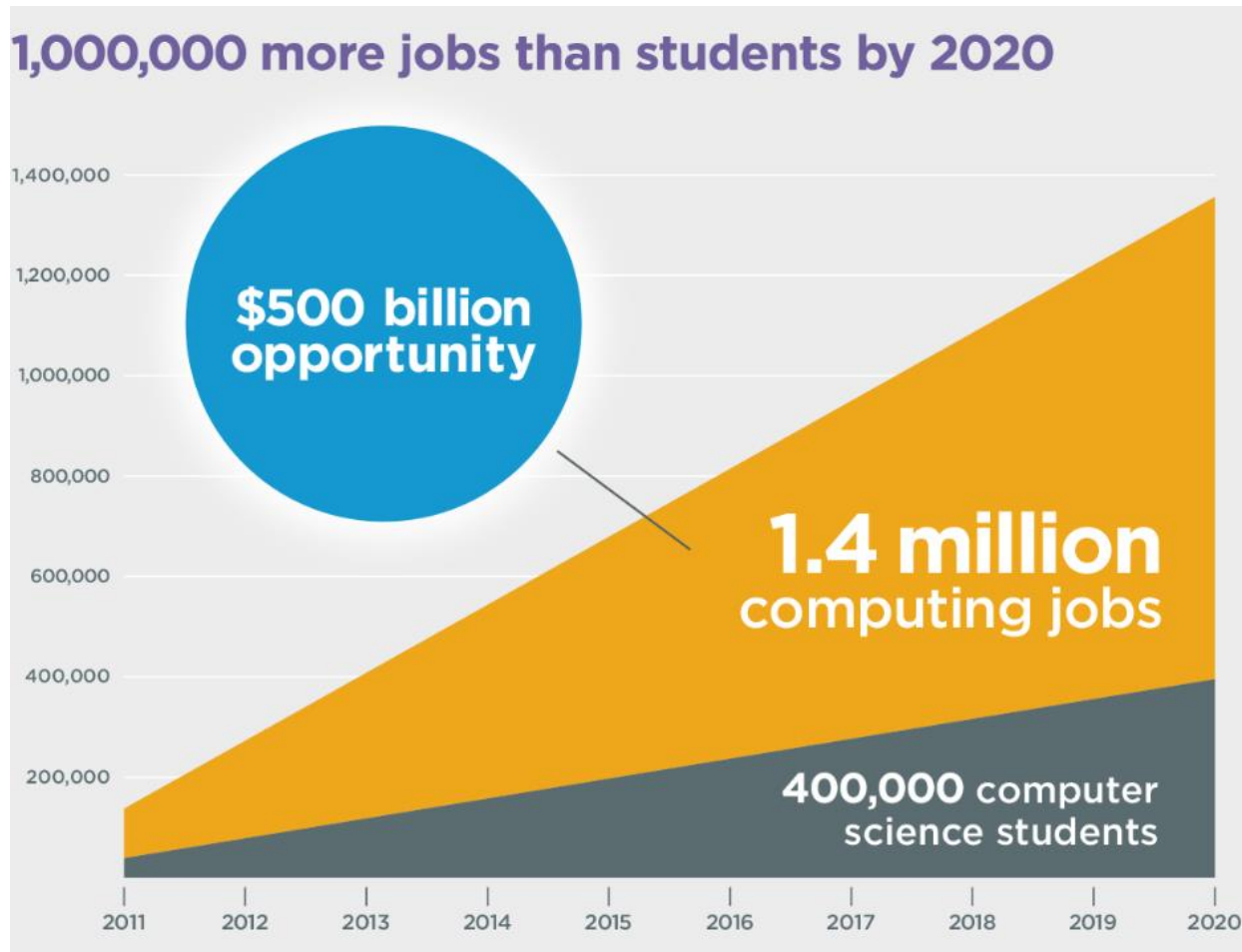


# Computers and Electronics products are California's largest export industry (42.4 Billion in 2013)





# 1M more CS jobs than students by 2020





# A lot of ICT Talent is Imported

Not only is it large and diverse, but California has a booming tech industry that houses Fortune 500 giants like Intel, Qualcomm, Google, Oracle, Apple and Ebay.

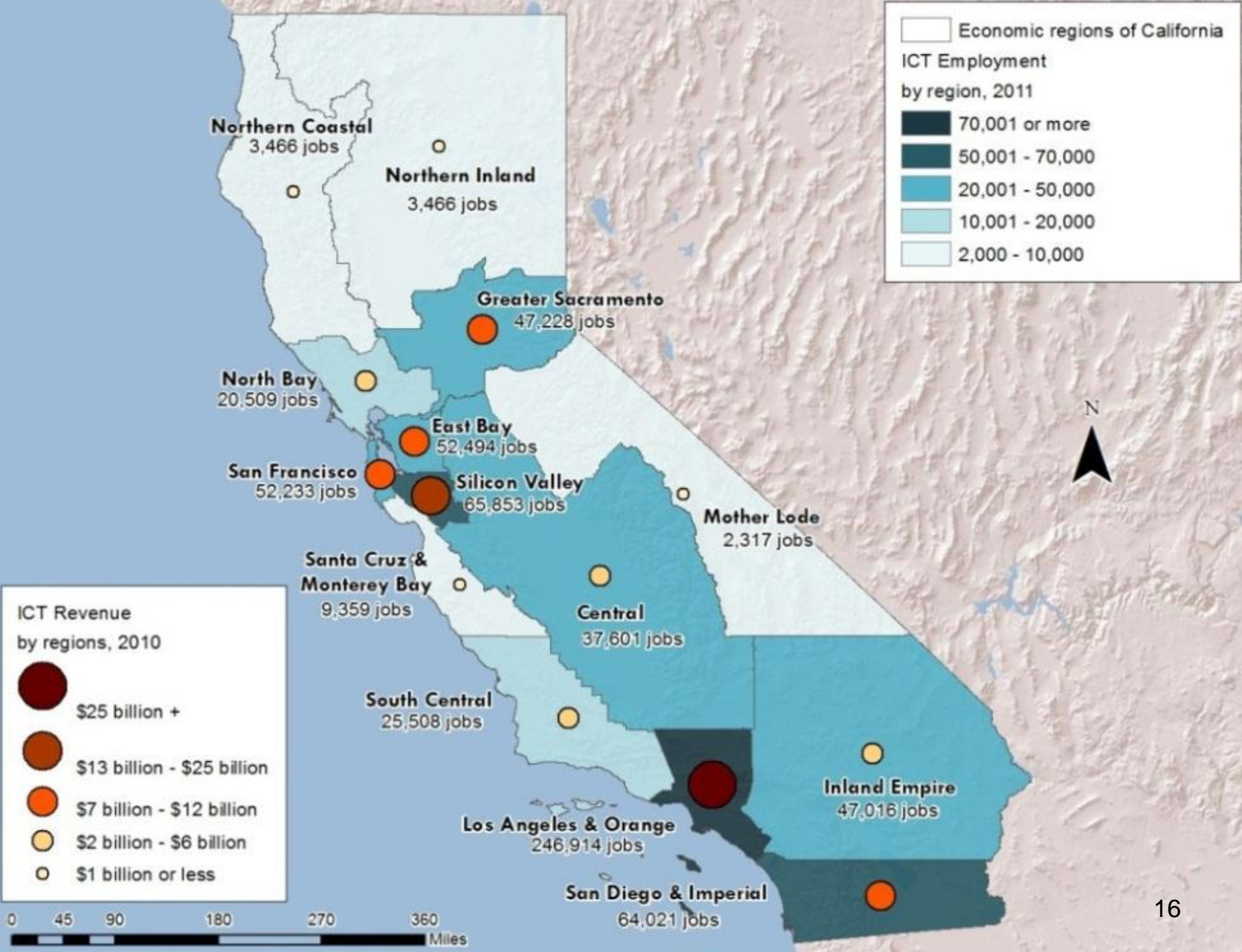
California consistently ranks as the No. 1 state for H1-B visa sponsorship. (100,000 per year)

# H1B Occupations at Google

- Software Developers, Applications (4790)
- Software Developers, Systems Software (396)
- Computer Systems Analysts (380)
- Computer and Information Research Scientists (128)
- Market Research Analysts and Marketing Specialists (126)

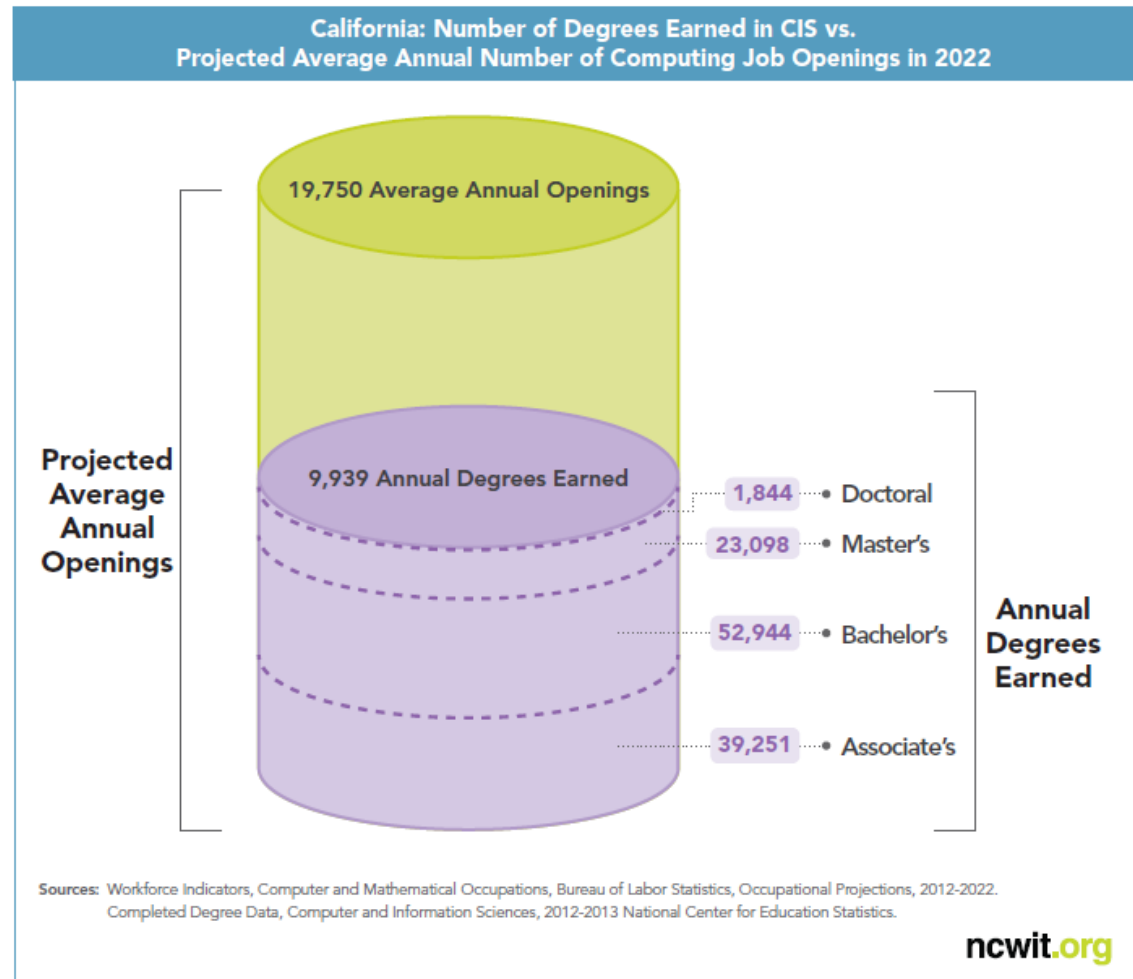
# Do you see your city?

3	San Francisco	11,347	\$103,234
4	San Jose	9,264	\$100,159
7	Sunnyvale	6,555	\$98,196
9	Mountain View	5,319	\$116,333
11	Santa Clara	5,125	\$102,136
15	San Diego	4,921	\$94,229
20	<u>Los Angeles</u>	4,073	\$78,194
24	Irvine	3,253	\$84,769
27	Palo Alto	3,086	\$110,416
33	Fremont	2,467	\$79,118
35	<u>Cupertino</u>	2,303	\$117,323
41	Milpitas	1,971	\$92,611





Currently 80,807 open computing jobs but only 5,127 computer science graduates (2014).



# Opportunity

Computer science: It's where the jobs are, but few schools teach it.

- Fifty-six percent of California public high schools don't offer a single course in computer science or programming.

# Schools in the 21<sup>st</sup> Century

“The new mission of schools is to prepare students to work at jobs that do not yet exist, creating ideas and solutions for products and problems that have not yet been identified, using technologies that have not been invented.”

Dr. Linda Darling-Hammond,  
The Flat World and Education

# What is Computer Science?



# Defined in regulation...

“Computer Science is the study of computers and algorithmic processes, including their principles, their hardware and software designs, their applications, and their impact on society.”

# Key Skills Needed

Ability to work in teams

Adaptability to change

Ability to communicate

Preparedness to solve problems

Ability to manage oneself

Ability to create, innovate, and criticize

<https://csedweek.org/>

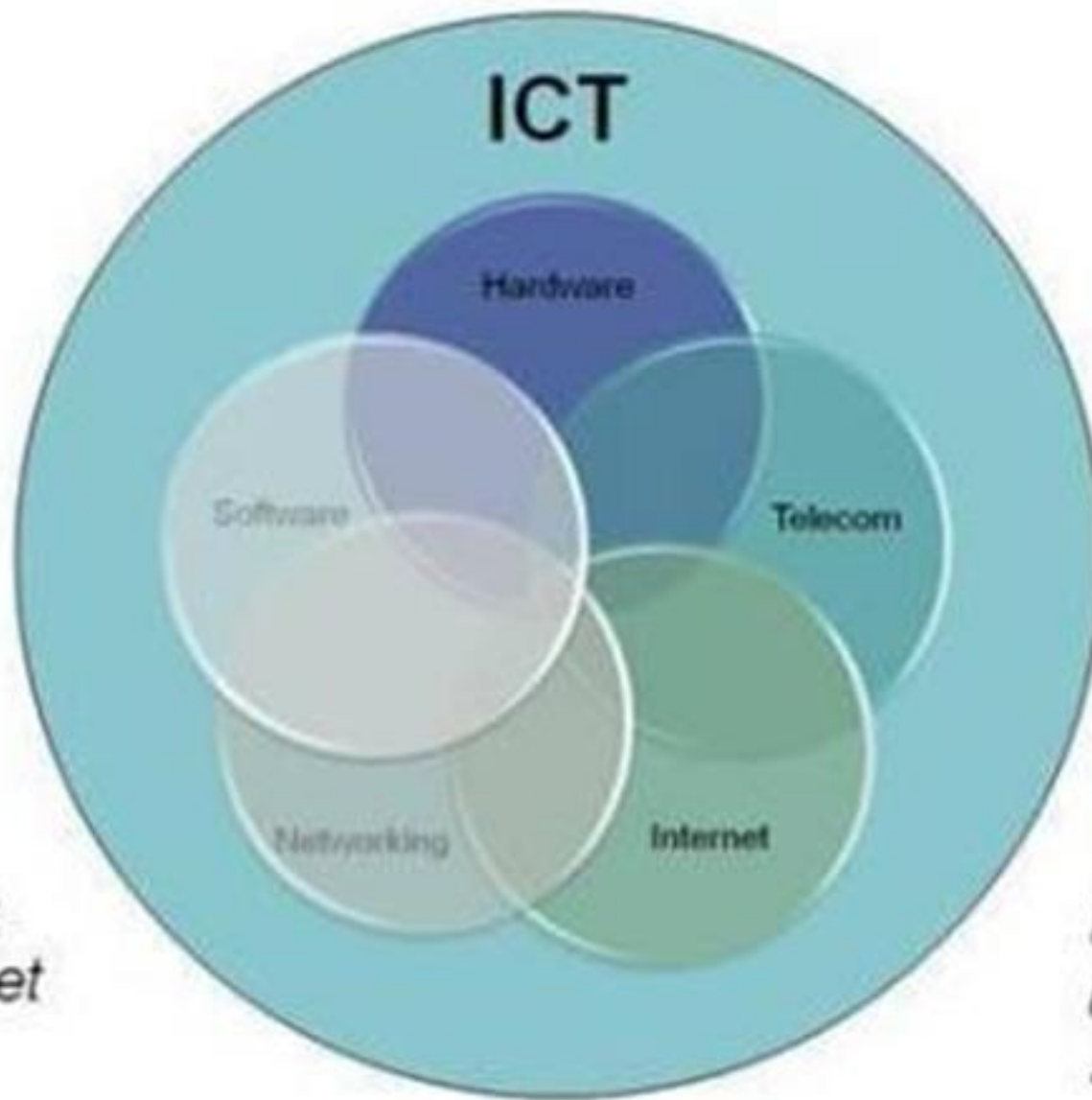
It's Computer Science Education Week!

Code.org – Hour of Code

# Why is ICT Important?

Information  
and  
Communication Technologies

# Information and Communications Technologies

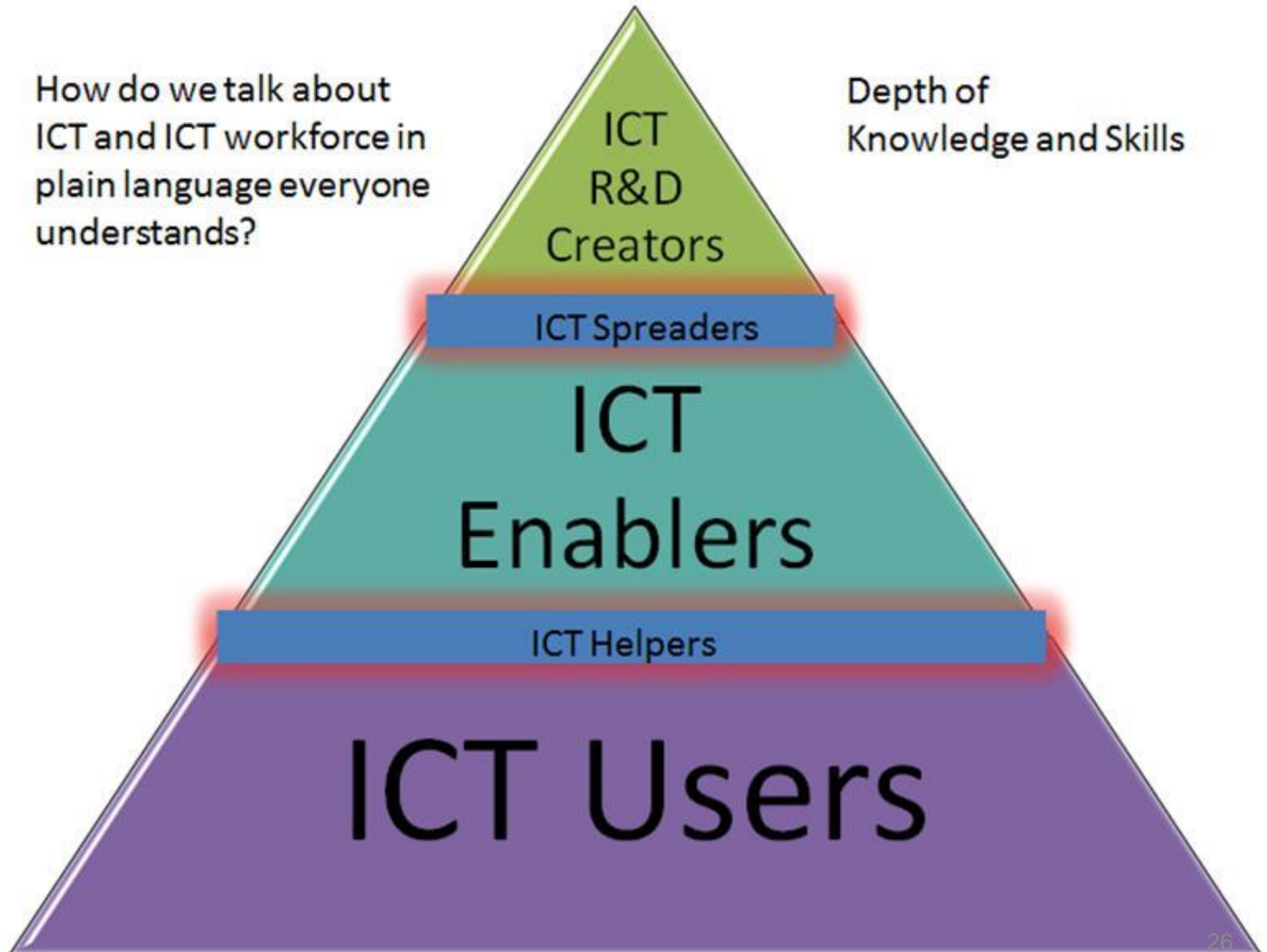


*ICT is a  
super-set  
term.*

*It does not  
replace any  
sub-set terms*

How do we talk about  
ICT and ICT workforce in  
plain language everyone  
understands?

Depth of  
Knowledge and Skills





California has Model Career  
Technical Education Standards for  
Teaching Information and  
Communication Technologies  
Subjects

# Information and Communication Technologies



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graph TD; A((Information Support and Services)) --- B((Games and Simulation)); B --- C((Software and Systems Development)); C --- D((Networking)); D --- A;
```

Information  
Support and  
Services

Games and  
Simulation

Software  
and Systems  
Development

Networking

# ICT Subjects Include:

ROBOTS

DRONES

NETWORKING

CYBERSECURITY

COMPUTER SCIENCE

OFFICE PRODUCTIVITY

GAME DESIGN & DIGITAL MEDIA

COMPUTER SERVICE AND REPAIR

Technology Today and Tomorrow

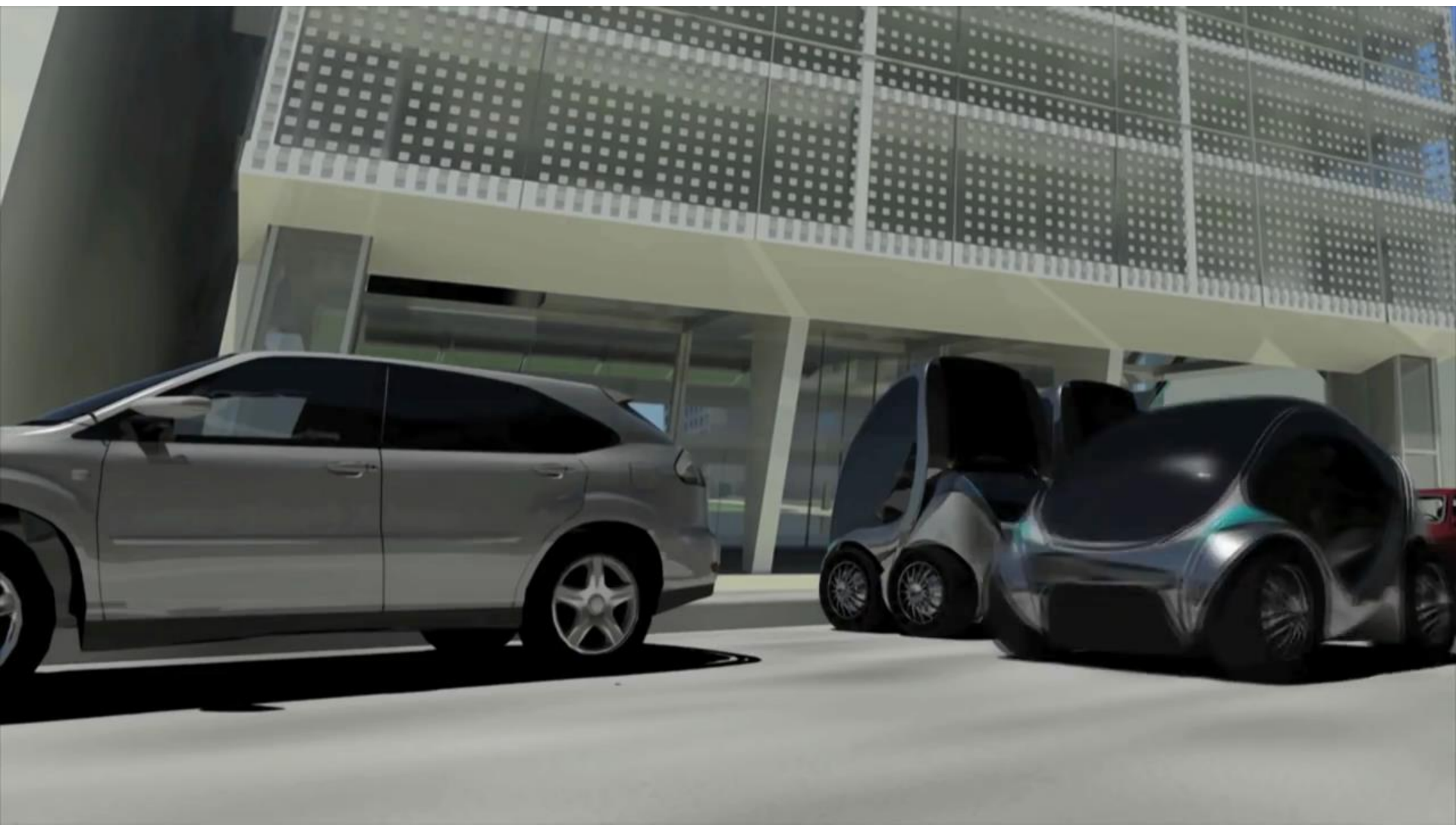
We Live In A Connected  
World



Technology Today and Tomorrow

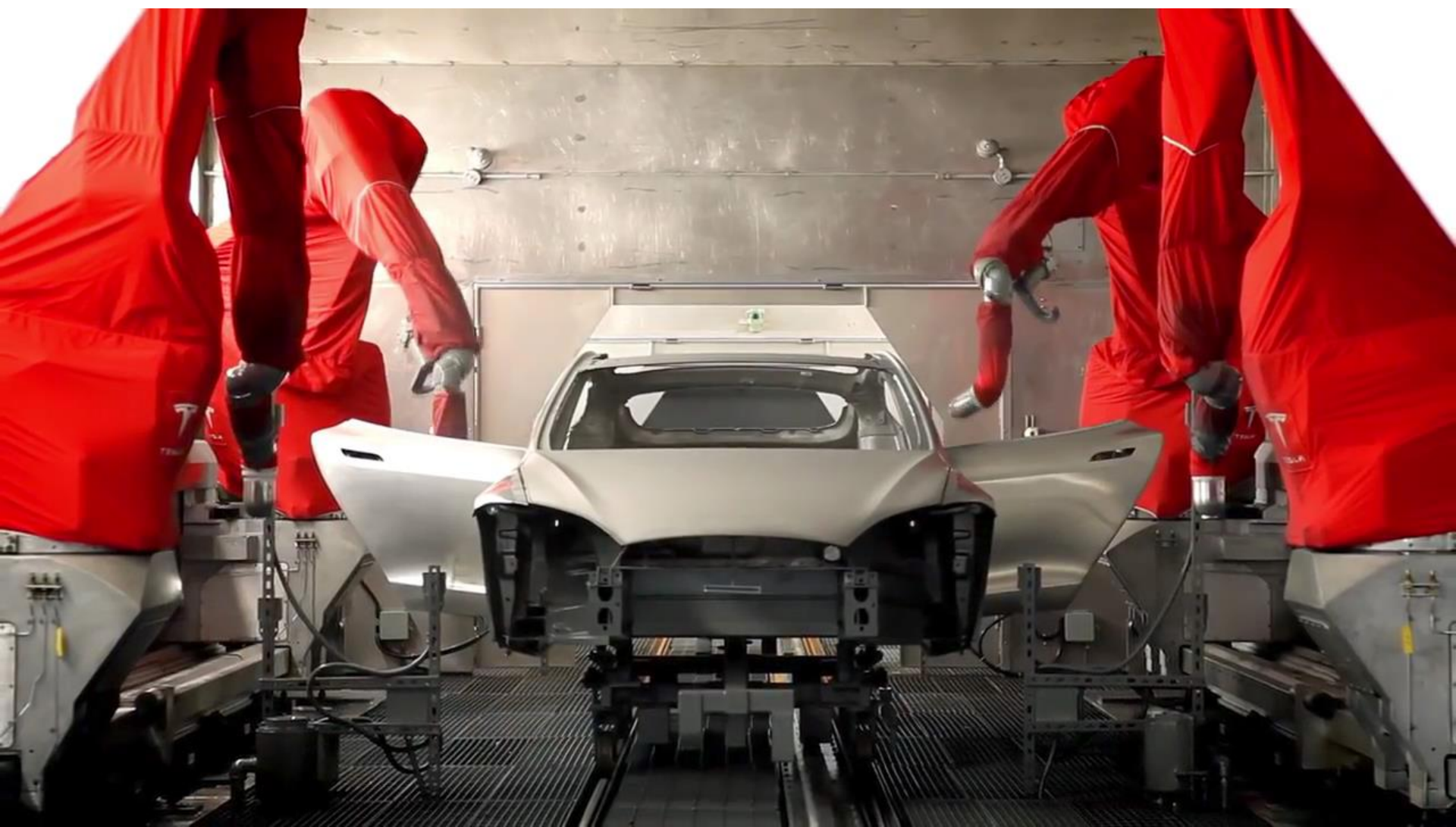
Coding Skills can lead to High  
Paying Jobs!





Technology Today and Tomorrow

Robots help build Cars at the  
Tesla Factory in Fremont  
California



# Technology Today and Tomorrow

We need a pipeline of  
talented people with  
Computer Security skills.



# Kids R Crazy about ICT





# HS Hacks 1200 Students





# Hacking a Drone



# Pizza Fuel



# Girls Allowed

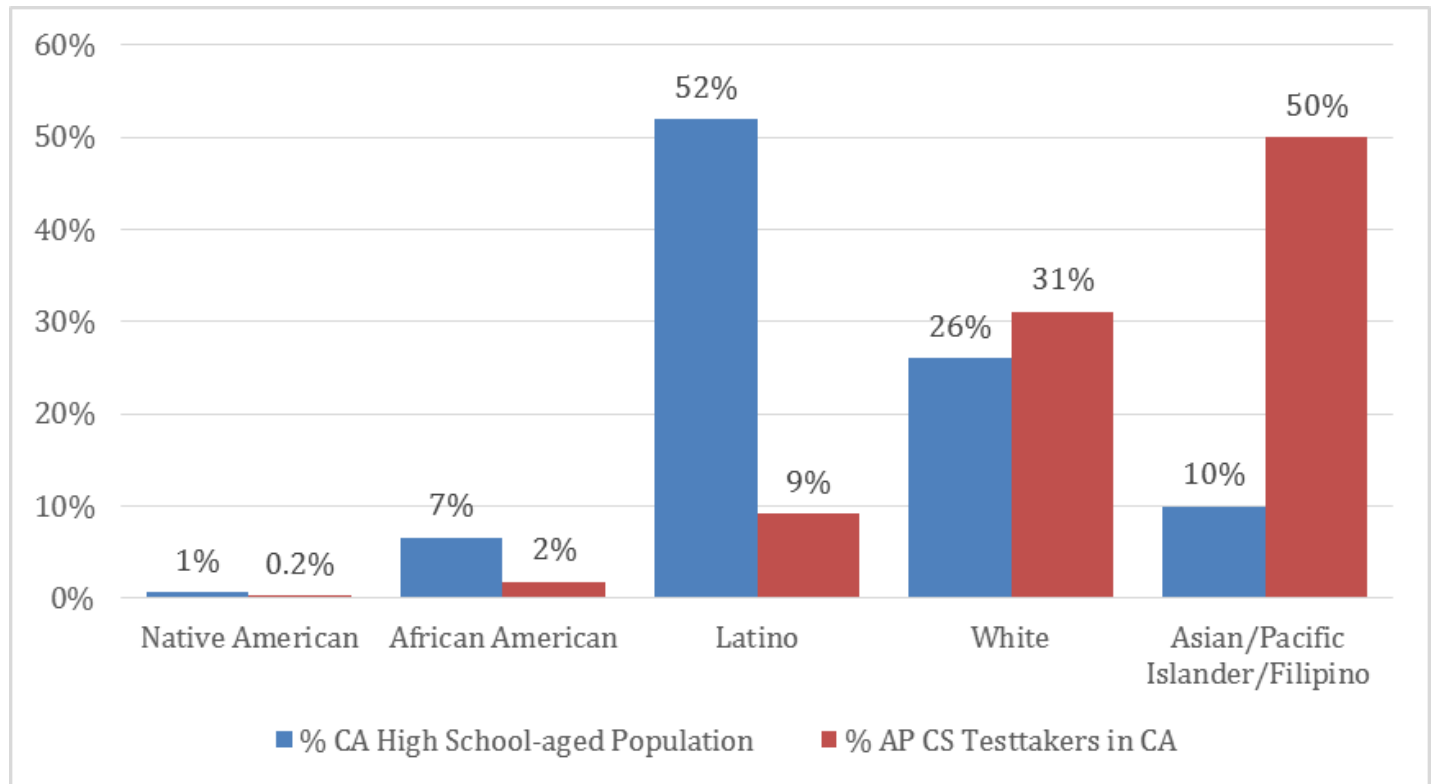


# Success!





# Disparities





# Google/Gallup Research

91% of parents want their child to learn Computer Science.

But, less than...

30% of administrators and teachers say it's a top priority at their school.

# Latino Institute for Corporate Inclusion Research

- Need to Increase Latino and African American representation in the ICT workforce.
- Provides recommended strategies

# What do you see?



# Announcement

**June 10, 2015 (San Francisco)–**

The San Francisco Unified School District plans to phase-in teaching computer science to all students, at all schools, from preschool to 12th grade.

# Implementation Challenges

- Teacher Quality and Authorization
- K-12 Standards/Curriculum
- Master Calendar Changes
- CTE and/or Academic Focus
- Central Coordination/Support

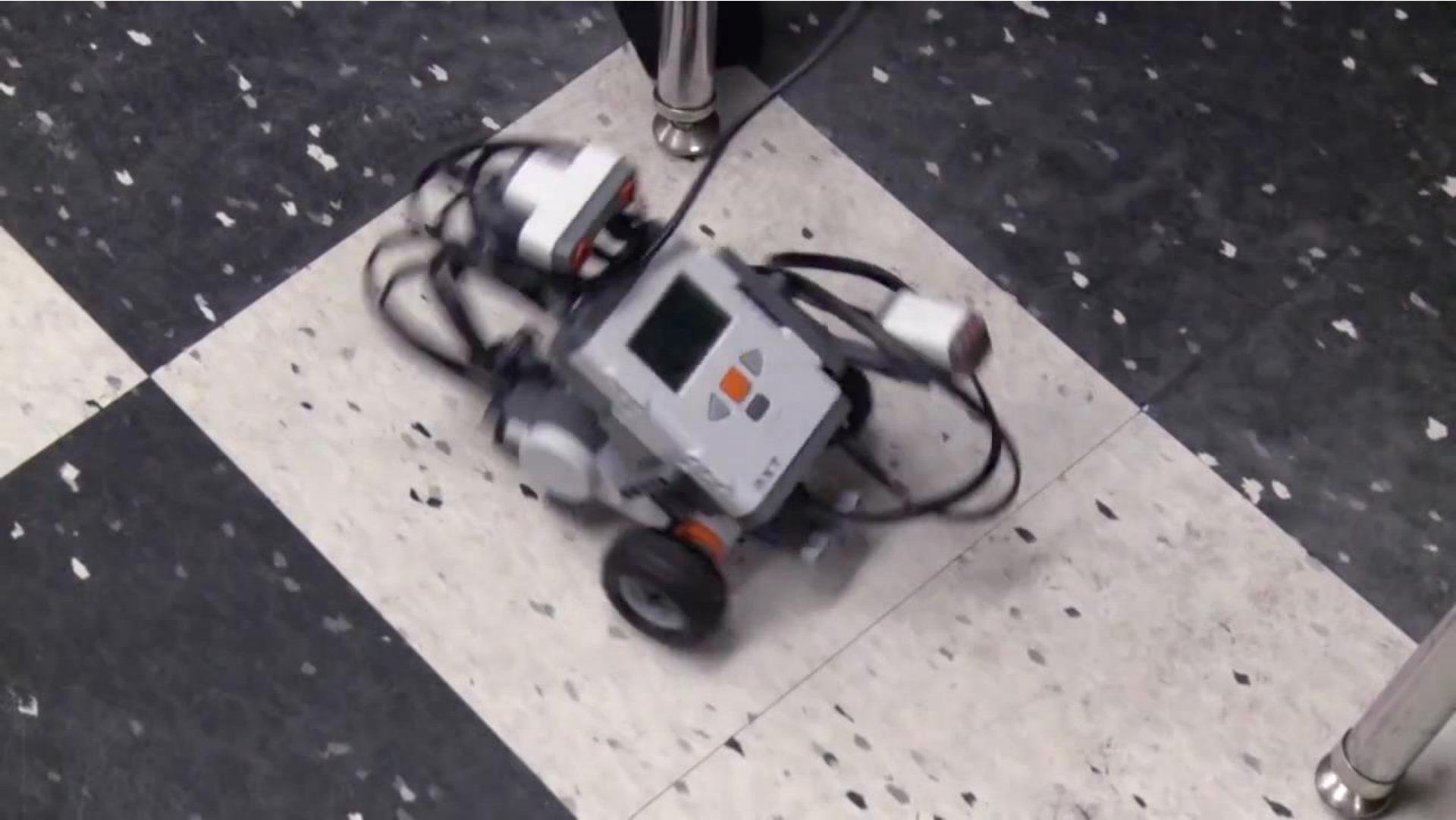
# Much Progress!!!

Schools throughout California are adopting ICT elective courses related to computer science.

The ICT sector attracted 17% of recent CTE grant funding – the top sector.

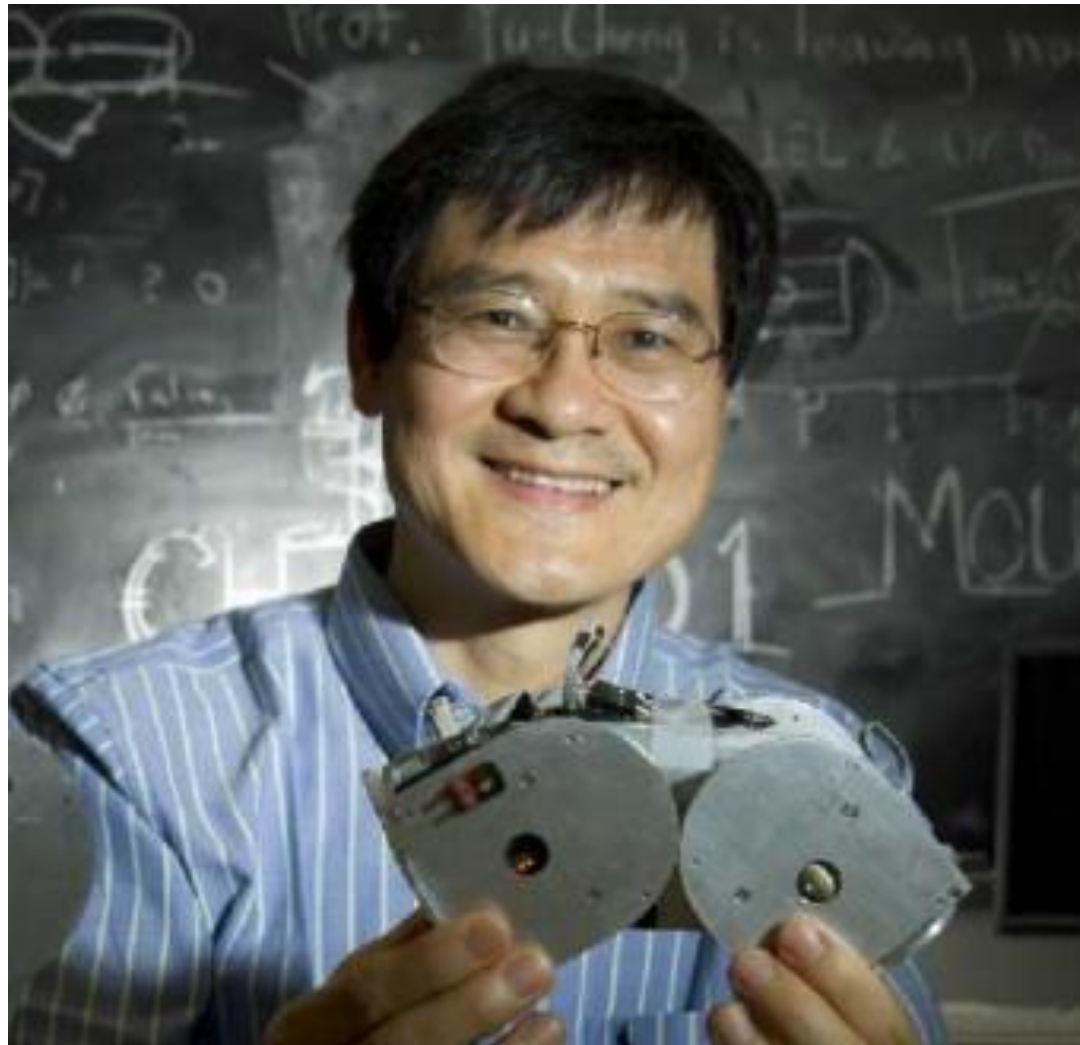
# Exploring Computer Science

- Excellent Introductory Course
- Developed in California
- FREE Curriculum (g-elective)
- Adopted Nationally
- “Common Core on Steroids”





# C-STEM UC Davis



# UC Davis Curriculum

Elementary, Middle and High School levels.  
Integrating Math with Computing and Robotics  
Youth and Girl Summer Camps  
UC Approved Program

# PLTW CS Curriculum

Intro to Computer Science

Computer Science & Software Engineering

Computer Science Applications

Simulation and Modeling

Artificial Intelligence

Cybersecurity

Computational Problem Solving

# Networking

The Internet of Everything (IoE)...

CISCO Networking Academy

Community College Articulation

Cyber Security – Cyber Patriots

# Computer Science TMC

Computer Science Transfer Model Curriculum will allow a student to transfer up to 60 units of credit earned at Community Colleges to the following CSUs:

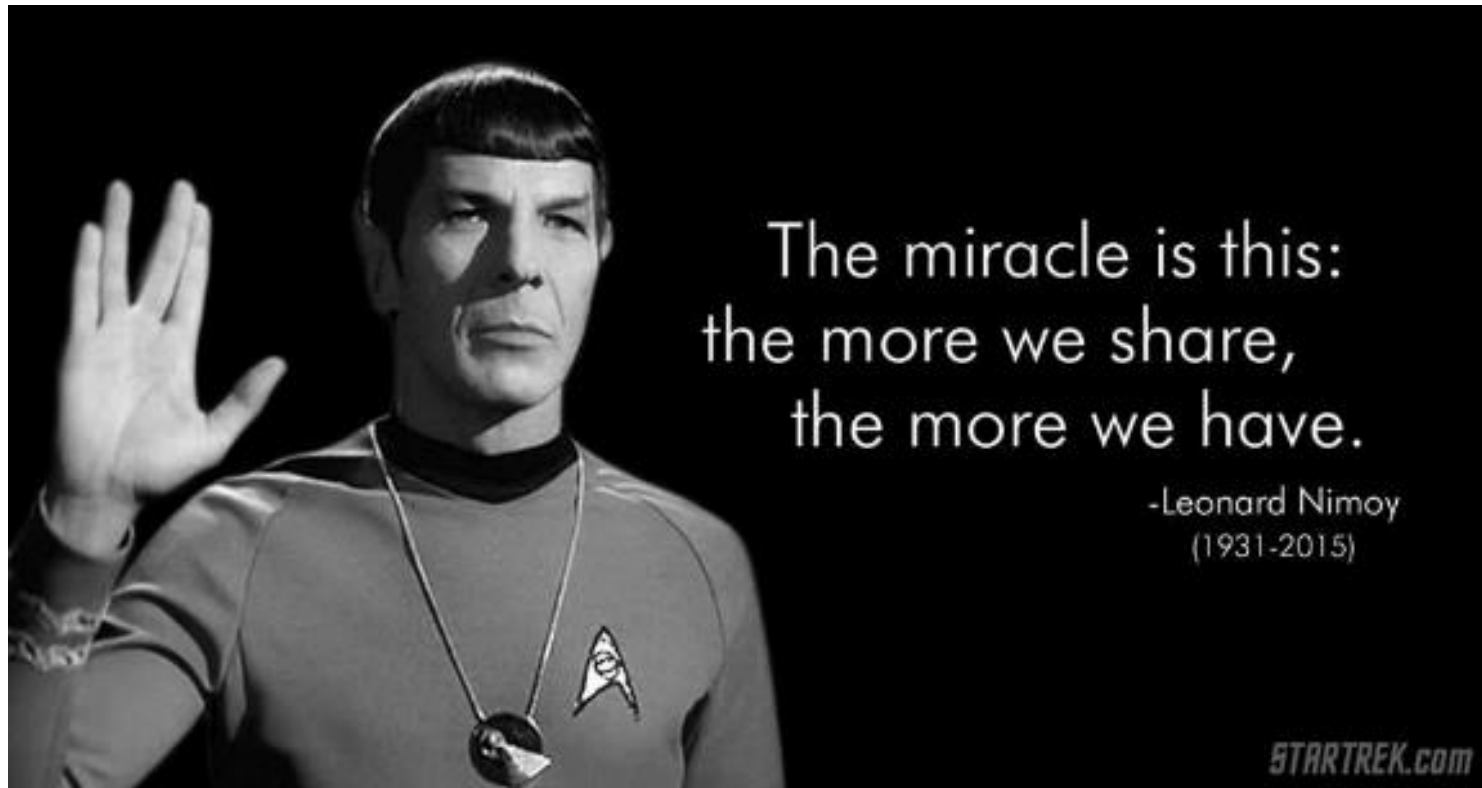
Long Beach  
East Bay  
Monterey Bay  
Fresno  
San Francisco  
Humboldt  
Sonoma

# The Future

“The future is not some place we are going, but one we are creating. The paths are not to be found, but made. And the activity of making them changes both the maker and the destination.”

- John Schaar

# T.E.A.M.



# Thank You

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