AIMS: Cover the **Seven Big Ideas** in computing

- As defined by the College Board for new AP test
- Computing is a creative human activity that enables innovation
- Abstraction is a way to understand and solve problems
- Data and information help to create knowledge
- Algorithms are tools for developing and expressing solutions to computational problems
- Programming is a creative process that produces computational artifacts
- Digital devices, systems, and the networks that interconnect them enable and foster computational approaches to solving problems
- Computing enables innovation in other fields, like science, engineering, humanities, etc.

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**What Is Computer Science?**

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**CS is collaborative!**

Meeting of a project team at Google

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**CS is creative!**

- CS is NOT just code
- Code is technical, but it’s also creative!

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**IT’s a Growth Sector**

U.S. Department of Labor’s Bureau of Labor Statistics reported in 2009 that computing-related occupations are projected to be the fastest growing segment of the professional workforce between 2008 and 2018:

1. Computer and Mathematical Sciences
2. Community and Social Services
3. Healthcare Practitioners and Technical Occupations


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**CS Jobs Benefit Society**

The Human Genome Project and the field of bioinformatics have revolutionized what is possible in forensics, health care, science, criminal justice and other fields through the creation of the DNA database.

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**Introducing Leah Buechley**

**Before College:** Interested in art and design, liked math.

**In College:** Studied fine arts, then computer science.

**Now:** Creates clothes that light up.
**Student Interests + CS = Innovative Careers!**

*Find out what you love to do and do that. It’s that simple.*

~ Dr. A. L. Garcia

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**Healthcare + CS = Something for everyone**

- Health informatics or (Bio)medical informatics:
  - Medical informatics
  - Bioinformatics
  - Nursing informatics
  - Genome informatics

Pictured above: DNA Database Laboratory and No-suspect Nuclear Case Work Unit in Connecticut

Photo: Connecticut Department of Public Safety, Forensics Division

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**Science + CS = Something for everyone**

- Bioinformatics
- Computational biology
- Genome informatics
- Cheminformatics

Pictured above: Human chromosomes on a black background, from the National Human Genome Research Institute

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**Criminal Justice + CS =**

- Criminal justice informatics
- Biometrics
- Forensic informatics/digital forensic science
- Information Security
- Bioinformatics

Pictured above: Classification of some biometric traits

Photo: Connecticut Department of Public Safety, Forensics Division

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**Humanities/Social Science + CS =**

- Motion graphic design
- Animation (2D & 3D)
- Computer graphics
- Computational linguistics
- Speech recognition software
- Human computer interaction

Pictured above: Digital art collage created by students at the Texas School for the Deaf in Austin, TX

Photo: Texas School for the Deaf
Education + CS =
- Educational technology
- Instructional design
- Assistive technology
- Electronic learning/e-learning/online learning
- Distance education
- Educational animation

Pictured above: Assistive speech generating devices for language learners and disabled learners
Photo: Specronicsinoz

Business + CS =
- Management information systems (MIS)
- Computer information systems (CIS)
- Database administrator
- Network administrator
- IT Portfolio Management

You Could Work For:
**Hardware and Software:**
- Microsoft
- Dell
- Sun
- IBM
- Intel
- Boeing
- Apple

**Web Search:**
- Google
- Microsoft
- Amazon
- Yahoo
- Vivisimo

**Financial Institutions:**
- Goldman Sachs
- Morgan Stanley
- Merrill Lynch

**Consulting:**
- Accenture
- Deloitte&Touche
- PriceWaterhouseCoopers

**Arts and Entertainment:**
- Dolby
- Lucas Arts Film Company
- Pixar Animation Studios
- Walt Disney Imaging

Can Computer Science Help the Environment?

Going for a drive
- You drive to an intersection where you can turn left or right.
- Which turn is faster to make?

Going for a drive
- If you turn left, how many lanes do you have to cross?
Going for a drive

- How about a right turn?

That’s Not Important.

- Actually, yes it is!

Cars use a lot of gas.

- Yes, they do.
- Even when they’re stopped.
- Even when you’re checking three lanes to see if cars are coming.

So let’s use less gas.

- So, turning right is faster
- And it saves you gas

But I don’t want to turn Right

- It’s true that one right turn might not save you any time at all, if you really just want to go left.
- But you know who makes a lot of right turns?

The Mailman Does!

- This guy makes a lot of right turns.
- He used to make a lot of left turns too.
- But not anymore.
He doesn’t have to go Left

- 90% of the time, he goes right.

- United Parcel Services (UPS) uses computer algorithms to find out how he can visit all the streets he needs to go to, making very few left turns.