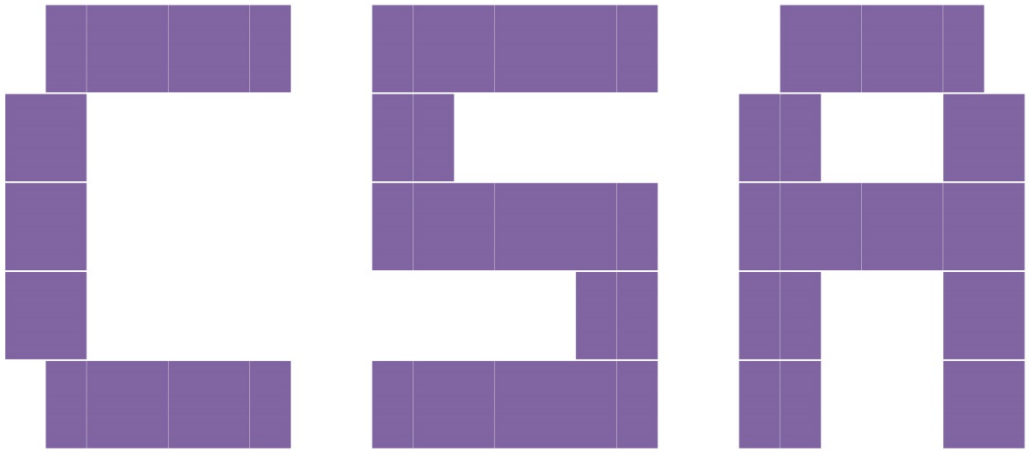

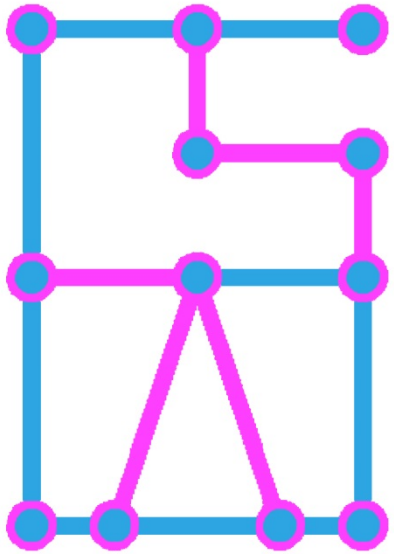

Computer Science Academy @ Galileo

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Creative Problem Solving for the 21st Century

CSINQUIRY.ORG

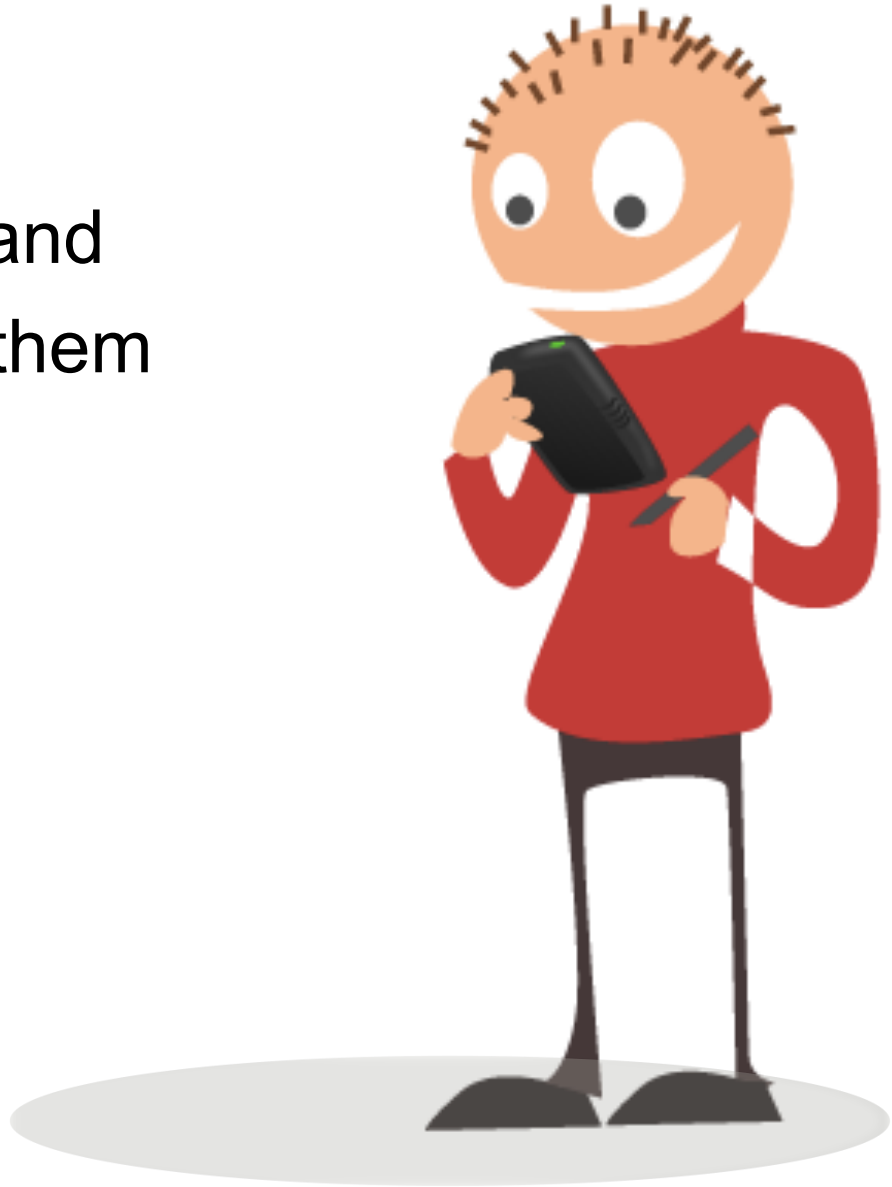
What is Computer Science?

CS is **posing a problem** in such a way that a **computer** can help us **solve** it.

- Communicate
- Solve problems
- Design and imagine
- Share, store, retrieve or manipulate information

What is Computer Science?

CS is **designing** computing devices and **programming** them



Why Computer Science?

- Computational thinking is important across **ALL subjects**, not just computer science.
- **More than 50 percent** of all math and science jobs are for computer scientists.
- Computer science jobs are the **highest-paying jobs** for new graduates.
- Computing jobs are **growing 3 times faster** than the number of computer science graduates.
- Information and communication technologies is **the fastest growing job sector** in San Francisco.
- You can create cool mobile apps, games, and other software that have an **impact on society**.

Computing Connects

music business manufacturing communications
advertising engineering accounting the arts
safety systems science
criminal justice recreation
veterinary medicine sports
agriculture pharmaceuticals
banking law automotive
photography military
architecture medicine entertainment design
politics journalism transportation health care

Only **50%** of tech jobs are at technology companies

Computer Science is *information systems*

Are you someone who:

- Understands relationships?

- Likes to do things efficiently?

- Is interested in business and connecting people?

Computer Science is *engineering new products*

Do you want to:

Create devices that can do the work for you?

Google Glass

Computer Science is
visualizing and creating imagery

Do you like:

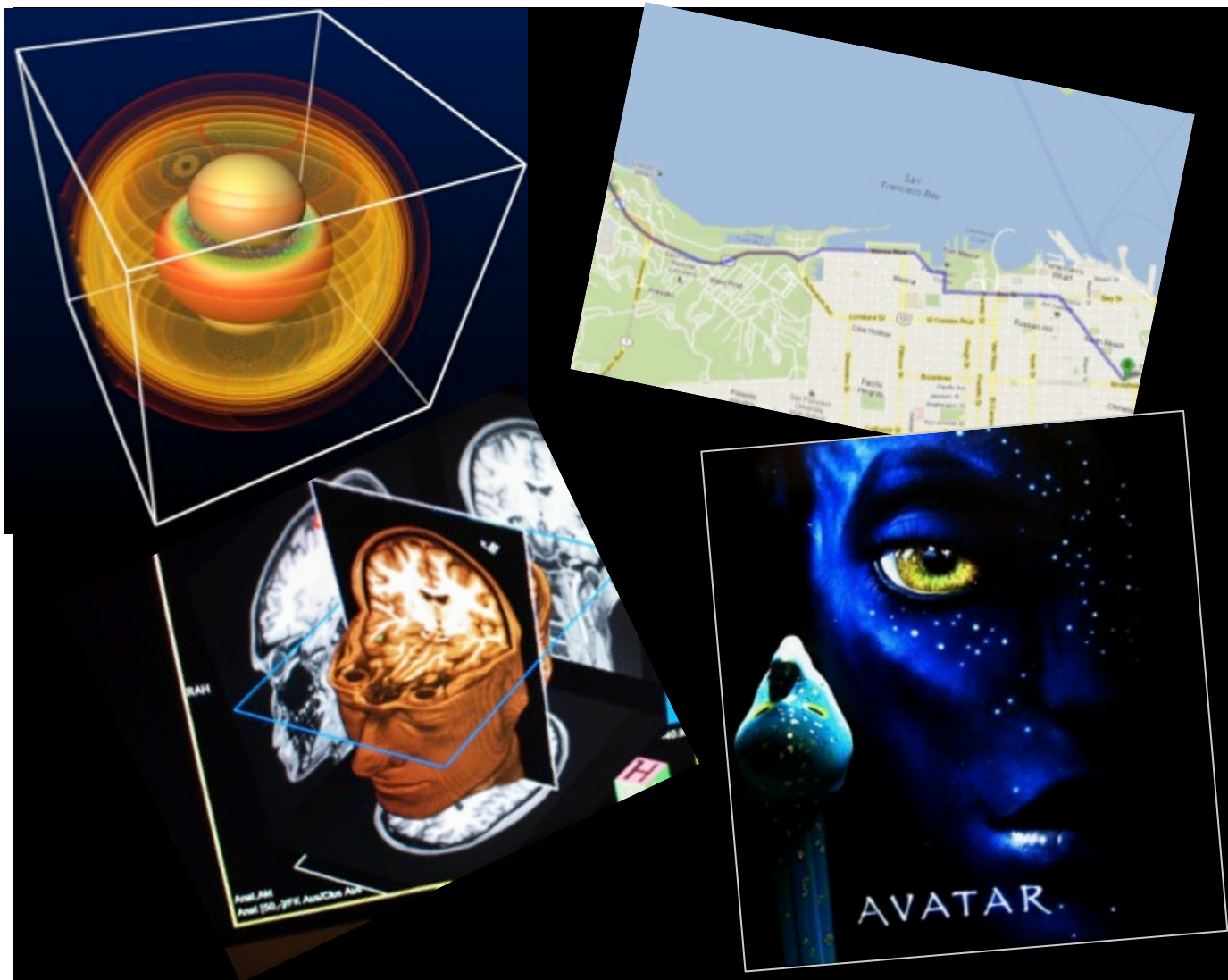
Art?

Science?

Game Design?

Theater?

Movies?

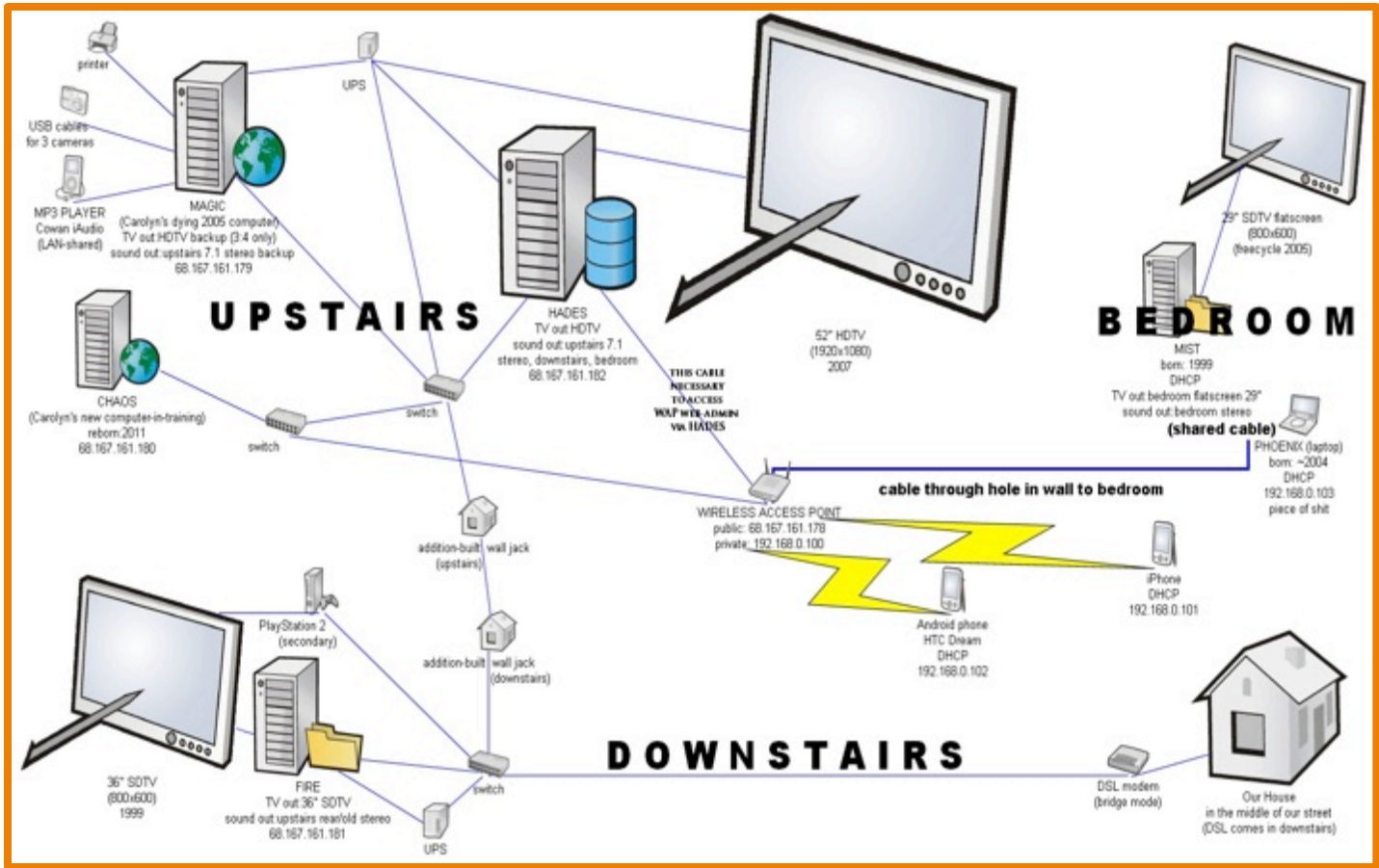


Computer Science is
Infrastructure and Networks

Do you want to help:

Keep computer systems up and running?

Invent new ways for technologies to connect?



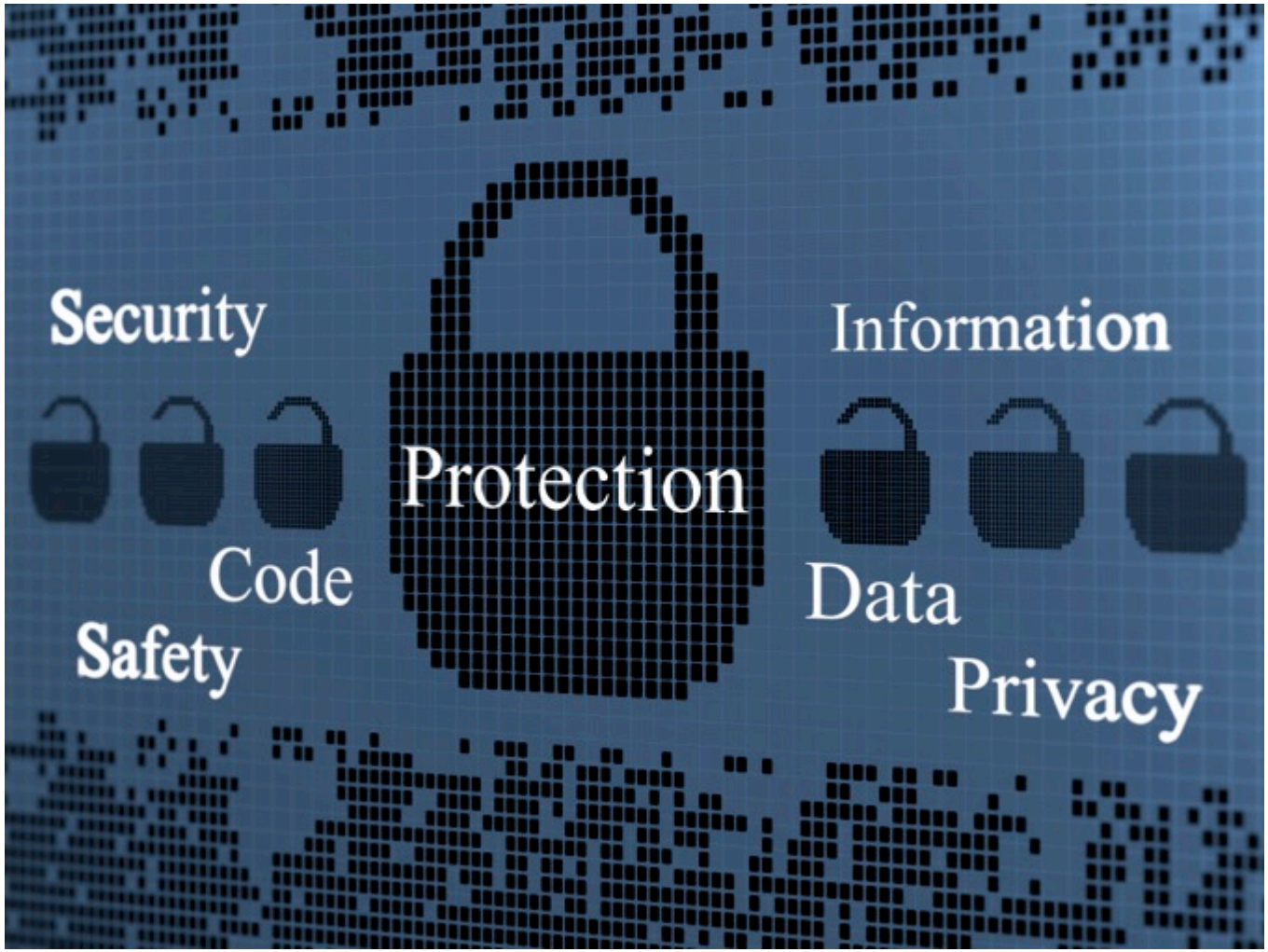
Computer Science is
Computer Forensics and Cyber Security

Do you want to help:

Solve crime?

Keep us safe?

Secure information?



Computer Science is *Design*

Do you want to:

Make models?

Design cars, houses, fashion, anything?

Is Computer Science for me?

- Creative
- Language skills
- Logical/mathematical
- Like technology
- Have multiple interests
- Like understanding how things work/curious
- Don’t give up easily/challenge yourself
- Calm under stress
- Like working with others
- Global mindset

Focus on Computer Science

Themes and Practices:

- The creative nature of computing
- Technology as a tool for solving problems
- The relevance of computer science and its impact on society

Current courses available @ Galileo:

- **Exploring Computer Science, mainly 10th grade**
- **AP Computer Science Principles, mainly 11th grade**
- **AP Computer Science A, mainly 12th grade**

Contact Info

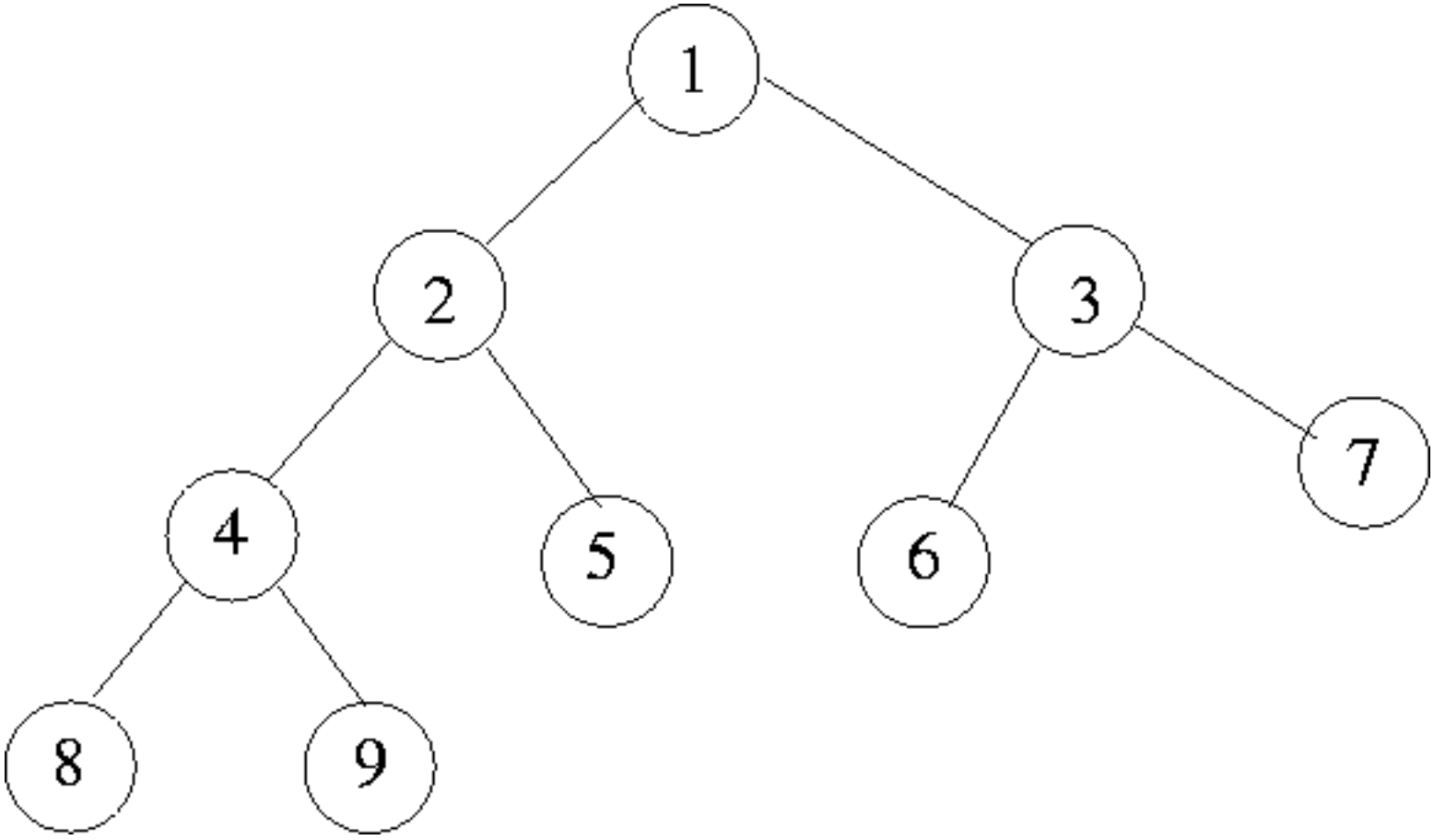
- Lead Instructor: **Mr. Danny Tan**
  Email: **tand@sfusd.edu**
  Phone: **415-749-3430 ext. 3102**
  Location: **Room 102 (first floor)**
  Website: **csinquiry.org**

Exploring Computer Science (10th grade)

- Computers and the Internet
- Societal impacts of computing
- Algorithms and abstraction
- Connections between Math and Computer Science
- Programming
- Models of Intelligent Behavior
- Web page design and development
- Data and Information
- Electronics/Robotics

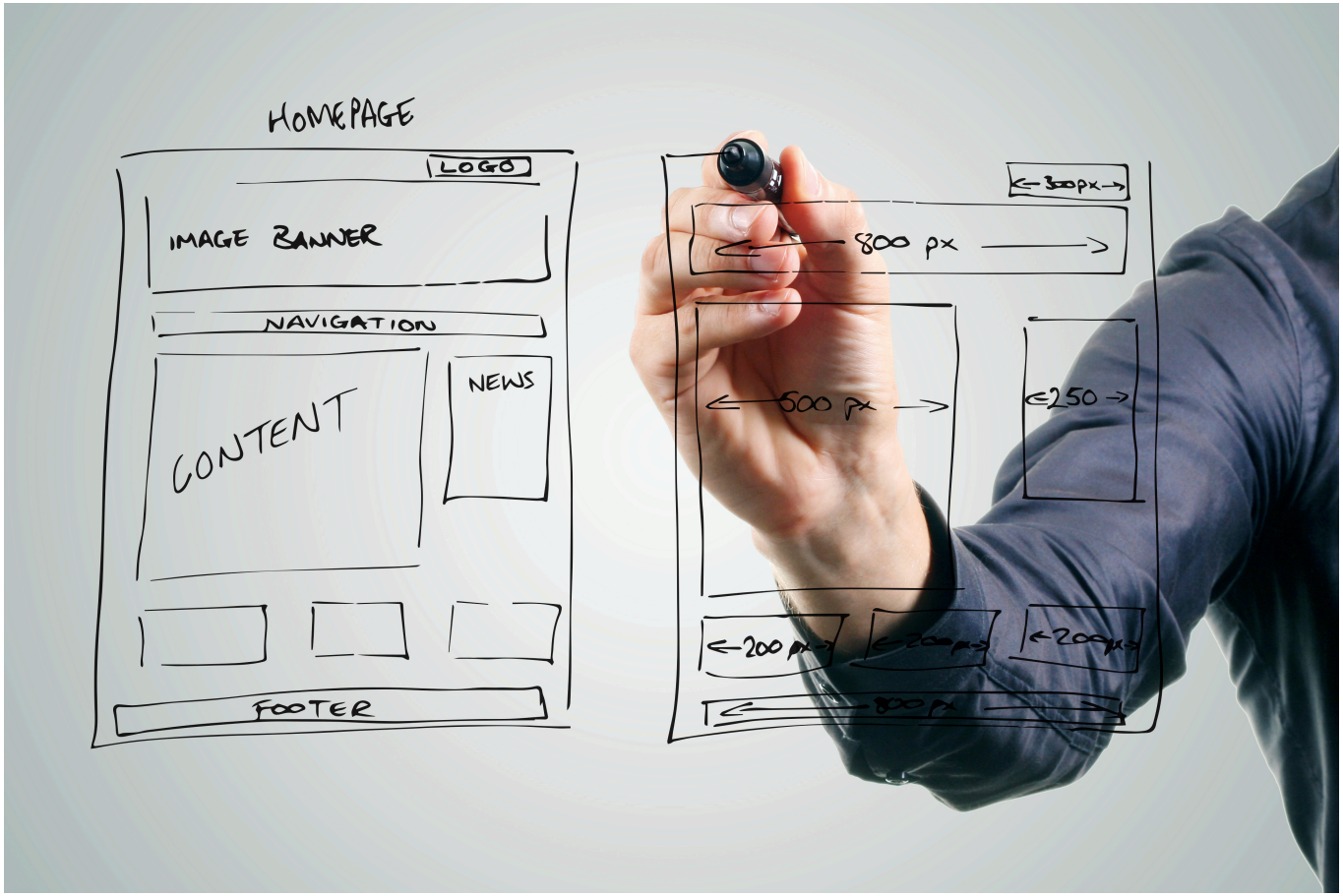
Exploring CS is…

- Algorithms and problem solving



Exploring CS is…

- Web Design

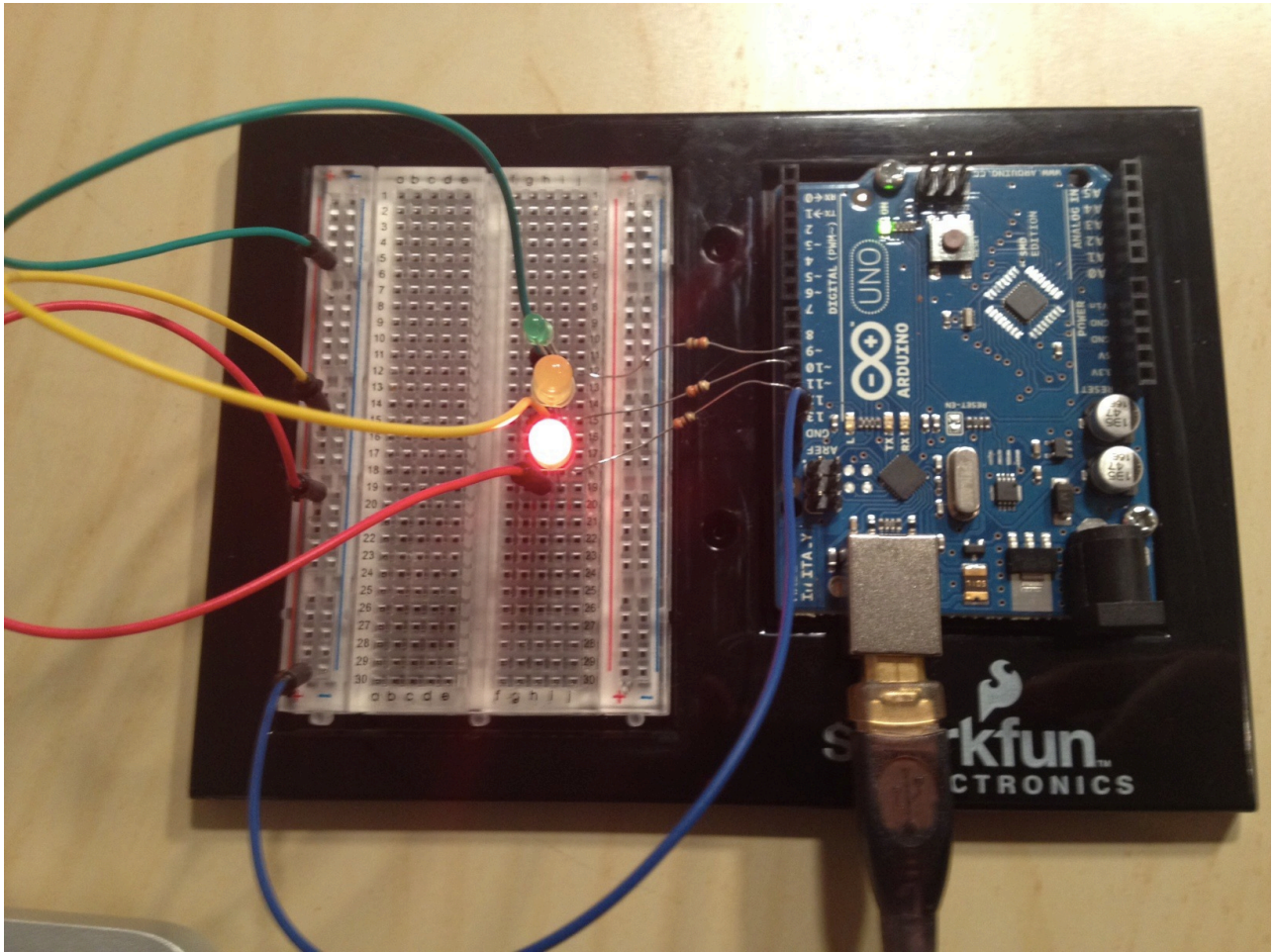


Exploring CS is…

- Programming

Exploring CS is…

- Electronics Prototyping



Exploring CS is…

- Societal Impacts

I help bring high-speed Internet to disadvantaged communities around the world.

Clare Liguori

Communications/ Internet Technology

I develop software for a cochlear implant that will help people who are deaf to hear.

Sahray Gambaro

Disabilities

I create 3-D fashion design software.

Anamary Leal

Fashion & Design/ Computer Graphics

I develop software that can design easy-to-build shelters for victims of disasters.

Claudia Gold

Humanitarian & Disaster Relief

I research ways to fight cybercrime and identity theft.

Tyelisa Shields

Internet Technology/ Forensics

I developed a "virtual nurse" for hospital patients.

Laura Pfeifer

Medicine

What if…?

- What if I want to be prepared for college?
  - Exploring CS meets the “g” subject requirement for UC/CSU college admission
- What if I need to take P.E.?
  - If you are taking Exploring CS, you don’t have to take the second year of P.E. until 12th grade
  - Exploring CS looks better on college apps than P.E.

What if…?

- What if I haven't programmed before?
  - Exploring CS is perfect for you! It's designed for beginners with no prior experience needed.
  - Consider taking the course with a friend (they probably want to take the course too!)
- What if I'm not good at math?
  - Computer science does involve math, but not everything is 1s and 0s. Language skills and critical thinking are just as, if not more, important for success.

AP Computer Science Principles (11th grade)

- First Semester:
  User Interface Design
  and Android applications
  - Focus on **Mobile Apps** and the **Design cycle**

ANDROID

MIT App Inventor

- Second semester: programming in the **Python language**

python™

Introducing
AP® Computer Science Principles

AP

CollegeBoard

Myth vs. Reality

MYTH: Computer Science is all about word processing, sending email, and using the Internet.

REALITY: While computer science makes those things possible, it's less about using specific applications than using the computer to address problems through new applications.

MYTH: Computer science consists of sitting in front of a computer by yourself, coding for hours on end.

REALITY: Computer science is creative and collaborative! Computers are elaborate tools for solving real-world problems, and teamwork is essential to developing those solutions.

MYTH: When I think of computer science, the only career that comes to mind is programming.

REALITY: Studying computer science can lead to hundred of career paths, including 3-D animation, engineering, entertainment, app development, medicine, visual design, robotics, political analysis and much, much more.

CollegeBoard

Myth vs. Reality

MYTH: Computer science is only for boys.

REALITY: Computer science is for everyone. Boy or girl, if you are creative, like to work in a team, and are interested in how technology can solve problems, computer science is for you.

MYTH: I'm not good at math, so I won't be good at computer science.

REALITY: Like all sciences, computer science does involve math, but not everything is 1s and 0s. Language skills and critical thinking are just as, if not more, important for success.

CollegeBoard

What do celebrities say about computer science?

- Karlie Kloss: Coding is a superpower
- NBA star Chris Bosh on Computer Science

What is AP® Computer Science Principles (AP CSP)?

Did you know that of the more than 9 million STEM jobs available in the next decade, half will require computing experience?

AP CSP, launching in fall 2016, prepares you by:

- Introducing you to the essential ideas of computer science.
- Challenging you to explore how computing and technology impact the world around you.
- Providing a foundation of knowledge that can be applied across disciplines, no matter what your major or career focus- from STEM fields to music and the arts. Chances are, no matter what field you're interested in, computers play a role.

CollegeBoard

What makes AP® CSP special?

- Creatively address world issues and concerns
- Use the same processes and tools as artists, musicians, engineers, computer scientists and others to bring ideas to life
- Conceptualize and build digital projects, such as videos or mobile apps, that have practical, real-world use
- Learn how to identify threats to cybersecurity and ways to use the internet to address such concerns

"AP Computer Science Principles opened my mind to just about everything. I learned that computer science and programming is not just for some people — it's for anybody." — **Mikiyah Smith,** Sophomore

What do my peers say about AP CSP?

- https://www.youtube.com/watch?v=S1vFrz4NETg

What do my peers say about AP CSP?

Students who took AP CSP in pilot schools say the course

- Gives the autonomy to pursue their passion
- Prepares for many different jobs in the future
- Gives freedom to select computing innovations they want to investigate
- Allows students to collaborate with peers to solve problems
- Leads to many creative possibilities

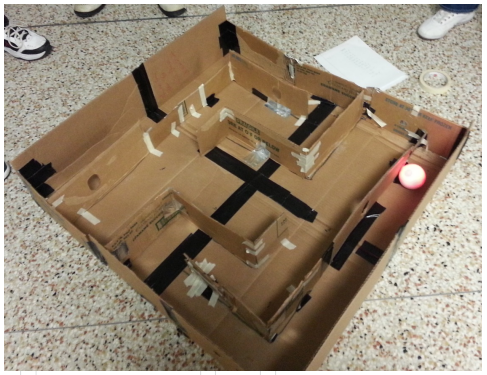
What is AP CSP about?

What it's about	The fundamentals of computing, including problem solving, working with data, understanding the Internet, cybersecurity, and programming
Goal	Broadening participation in computer science and other STEM fields by exposing you to multiple aspects of computing
The exam	▶ Two projects (one written and one computer-based) during the course ▶ One end-of-year exam: multiple-choice

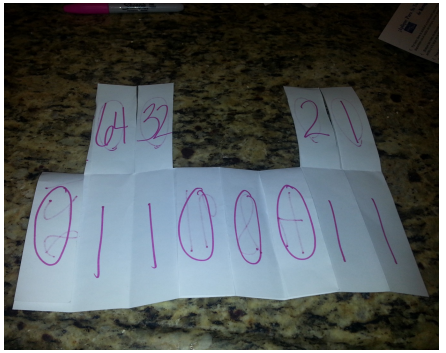
CollegeBoard

What does AP CSP cover?

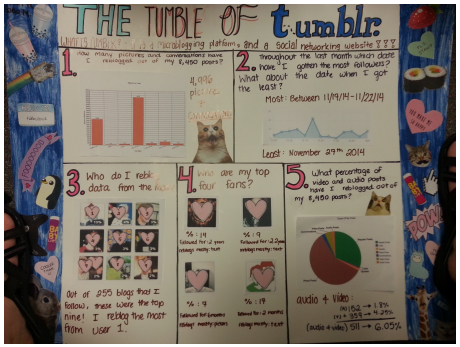
Creativity
Create a computational artifact for creative expression.



Abstraction
Explain how binary sequences are used to represent digital data.



Data and Information
Extract information from data to discover and explain connections, patterns, or trends.



CollegeBoard

What does AP CSP cover?

Algorithms
Express an algorithm in a language.

Programming
Collaborate to develop a program.

Global Impact
Analyze the beneficial and harmful effects of computing.

The Internet
Explain characteristics of the Internet and the systems built on it.

What does the AP CSP exam cover?

Part I: Through-Course Assessments

1. Upload digital artifacts (e.g., a video, spreadsheet, graph, app, electronic slide show) and written responses via a Web-based digital application.
2. Describe or analyze your work, whether it includes research, the creation of a digital artifact, or the creation of a program.

Part II: End-of-Course AP Exam

- Paper and pencil written exam
- 120 minutes with 74 multiple choice questions
- First administration May 2017

What college majors can you pursue with computing?

Colleges and universities offer many majors that make use of computing, like:

- Aerospace Engineering
- Applied Physics
- Astronomy
- Botany
- Business Administration
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Computer Forensics
- Computer Graphics
- Computer Science
- Economics
- Education
- Electrical Engineering
- Electronics Technology
- Environmental Studies
- Geography
- Geology
- Industrial Engineering
- Information Science
- Information Technology
- Linguistics
- Management Information Systems
- Marine Biology
- Mathematics
- Mechanical Engineering
- Molecular Biology
- Neuroscience
- Nuclear Engineering
- Physics
- Robotics Technology
- Statistics
- Studio Arts
- Web Development
- Zoology

collegeboard.org/CSP

CollegeBoard

What can your future be like?

Taking AP Computer Science Principles can lead to a future in over 100 careers.

- Advertising Manager
- Aerospace Engineer
- Aircraft Pilot
- Architect
- Art Director
- Astronomer
- Biomedical Engineer
- Chemical Engineer
- Coach
- Computer Programmer
- Editor
- Economist
- Electrical Engineer
- Dentist
- Forensic Scientist
- Financial Manager
- General Practitioner
- Geoscientist
- Graphic Designer
- Market Researcher
- Mathematician
- Medical Scientist
- Meteorologist
- Multimedia Artist and Animator
- Nuclear Engineer
- News Analyst, Reporter
- Pharmacist
- Physical Therapist
- Psychiatrist
- Real Estate Broker
- Statistician
- Surgeon
- Technical Writer
- Translator
- Veterinarian
- Web Designer

collegeboard.org/CSP

Take the next step

- Visit **collegeboard.org/CSP** to learn more
- Speak to your counselor about how to enroll
- Consider taking the course with a friend (they probably want to take the course too!)

Previous experience with coding is not required to be successful in this course.
A home computer, while a good idea, is not required to take this course.


Create The Future

AP Computer Science A (12th grade)

- Java Programming Language
- Object-Oriented Program Design
- Program Implementation
- Program Analysis
- Standard Data Structures
- Standard Algorithms
- Computing in Context

Focus on **DESIGN** and **ANALYSIS**

How is AP CS A different from AP Computer Science Principles?

	Computer Science A	Computer Science Principles
What it's about	Programming and problem solving using the Java language	The fundamentals of computing, including problem solving, working with data, understanding the Internet, cybersecurity, and programming
Goal	Developing your skills for future study or a career in computer science or other STEM fields	Broadening participation in computer science and other STEM fields by exposing you to multiple aspects of computing
The exam	One end-of-year exam: multiple choice and free-response	▸ Two projects (one written and one computer-based) during the course ▸ One end-of-year exam: multiple-choice

CollegeBoard

Should I take AP CS A?

- Should have some programming experience already (if not, but you are still interested, talk to Mr. Tan)

- Should take the course if you plan on studying computer science or other science, technology, engineering, math subjects in college