



Lesson Plan: Applications and Implications of Computer Science

Instructional Days: 1-2

Topic Description: Some applications of computer science that may immediately come to mind include the internet, email, or computer games. But computer science is such a far-reaching field that most people's personal and professional lives have been affected by computers in many ways even if they work in a non-technical field.

Objectives:

The student will be able to:

- Identify applications of computer science in personal and professional lives.
- Think about computer science as a form of creativity and as a way to create tools.
- Use the terms “hardware” and “software” in discussing applications of computer science.
- Develop ideas of new applications of computer science related to their own lives and interests.
- Discuss the implications of computer science applications.

Outline of the Lesson:

- “Code Stars” video introduction and preliminary discussion (10 minutes)
 - Introduce Code.org; Unit 2 will include more videos and activities from their “hour of code”
 - Make sure everyone is somewhat familiar with Microsoft, Twitter, Facebook, and Dropbox, and talk about how the impact of their technologies: how are they used? How do they change the way people live and work?
 - Raise key questions to think about during the video:
 - Where is computer science used?
 - How is computer science used?
 - Why do we use computers?
 - Why should we study computer science?

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- “Code Stars” video (10 minutes)
- “Code Stars” video debrief: why does the video call computer scientists the “wizards”, “rockstars”, and “super heroes” of the future?(10-20 minutes)
 - Computer scientists (in this case, software programmers), make and shape tools that change the way people live and work.
 - Software is a huge industry and as corporations, they have lots of impact: think about the Bill & Melinda Gates Foundation. That money comes from computer science!
 - Almost all jobs and hobbies are affected by computer science in some way or other!
 - Think about “unconventional” computers, like automated assembly lines, a car GPS, smartphones,...
 - What kind of software instructions do these items carry out?
 - How do these items change the way people live their lives?
 - What are your interests? How might you use computer science?
 - Sample images given: fashion retail, manufacturing and design, animation, extreme sports, music, weather forecasting, criminal justice, reading, economics, scientific modeling (chemistry), space exploration.
 - Encourage students to think of direct ways they’ll be using computer science (using computers and software programs) and also indirect ways (use equipment produced by computers, rely on calculations performed by computers, work with people who are computer scientists...)
- Bonus videos [updated June 2014]: Watch as many as time allows; feel free to find other activities, discuss other questions, or even have students find and present their own videos!
 - Sports: Garmin Swimming Watch
 - Is the watch a computer?
 - How does this change the way people live or work?
 - Art: Adobe Illustrator (just watch 30 seconds; no need to watch all 11 minutes!)
 - When Adobe sells the Illustrator product, are they selling hardware or software?
 - Illustrator is a software program.
 - How does this change the way people live or work?
 - Music: Synthesizers, Mixers, Editing Equipment

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- What equipment would you consider to be a computer? Why?
- How do these computer science applications change the way people live or work?
- Healthcare: PET Scanners and Imaging
 - How does medical imaging relate to computing?
 - 3-D images are reconstructed using software programs that calculate where signals came from based on when they are received by a detector. Humans would not have the computational power to do this!
 - Can you think of other healthcare applications that require computer science?
 - How does using computer science change healthcare?
- Journalism, Writing, and Sharing: Blogs
 - How many people read blogs? How many people have a blog?
 - Why do you read or write blogs? How is it different from other forms of written media?
 - How does blogging change the way news travels?
 - How does blogging affect privacy? Is blogging safe?
- Filming, Sports, Outdoors: GoPro Camera
 - How are cameras computers?
 - How has computer science changed extreme sports?
 - Direct: allow us to capture the experience from new points of view, athletes can create websites and social media pages to amass fan base, distribute news, and sell products.
 - Indirect: computer programs improve engineering, allows for the construction of better equipment.
- Photography and Social Media: Instagram
 - Do you think smartphone and Instagram photos contribute to photography as an art?
 - How do these photos change the way photographers work? Journalists?
 - How does easy, instant photo-sharing affect safety and privacy?
- Wrap-Up discussion (10 minutes)
 - What other computer science technologies do you use? Why do you use them? How have they changed the way you live or work?