The Internet, Creativity, and Global Impact

AP CS Principles Curriculum Modules

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A. Philosophy of CSP Curricular Modules
B. Internet Activity
C. Global Impact Activity
D. Short Break
E. Creativity Activity
F. Feedback and Closing Comments
Challenge:
Increasing interest with students, especially those who are underrepresented in CS education (females and minorities)

Philosophy and Instructional Approaches:
➢ Student engagement is key!
➢ Building a sense of community in the classroom
  ✓ positive effects on academic achievement
  ✓ Improvement with gender and interethnic relationships
➢ Quality learning experiences with rigorous CS concepts
Purpose: provide exemplary instructional resources to pilot teachers

- Each module includes two sample syllabi, and two classroom lessons
- Each lesson is comprised of one or more instructional activities
Topics and lessons were identified based on:

» potential for increasing interest with students, especially those underrepresented in CS education;

» curricular topics that present specific instructional or learning challenges based on pilot data or instructor experience.
Welcome to the AP Teacher Community
Lesson Design Philosophy

Where are my students now?
Where do I want to get them?
How will I get them where they need to go:
  - actively
  - creatively
  - equitably
  - by solving problems
Enduring Understanding 7.3
Computing has a global effect - both beneficial and harmful - on people and society
Philosophy of Global Impact:

Q: When students enter high school, what is their definition of global?

Q: What is their impression of new computing innovations?
Philosophy of Global Impact

Q: How would we like our students to grow in the areas of
- defining what “Impact on society” means?
- considering the effects on people and society of a new computing innovation?
Teaching Global Impact:

Help students expand their definition of what “global” means. What are the impacts of computing innovations?

Help students look at new apps and other innovations with a critical eye.
1. Imagine you work for a retail store. You want to start a new marketing campaign based on data. What is the store? How will you collect the data?
2. How could you combine your data with other data sets or other algorithms?

3. What form will your marketing take?
Enduring Understanding 6.2
Characteristics of the Internet influence the systems built on it.

Enduring Understanding 6.3
Cybersecurity is an important concern for the Internet and the systems built on it.
Teaching Internet

Q. When students enter high school, what is their impression of
- how the Internet works?
- how is cybersecurity related to the characteristics of the Internet?
Q. How do we want students to grow in the area of...
   - how the Internet works?
   - how is cybersecurity related to the characteristics of the Internet?
Teaching Internet

- Turn the Internet’s “magic” into CS ideas
- Practice problem solving … (their algorithm)
- Past choices → present-day problems
Creativity and Global Impact Module

Chaos: Unlimited Resource for Creative Fun!
Creativity Activity:

Drawing a Square

Drawing an Equilateral Triangle

Using Regular Polygons to Generate Chaos
vertex[0][0] = 0.0;        // $x = x'\cos T - y'\sin T$
vertex[0][1] = 1.0;        // $y = x'\sin T + y'\cos T$

vertex[rep][0] = vertex[0][0] * Math.cos(theta) -
vertex[0][1] * Math.sin(theta);
vertex[rep][1] = vertex[0][0] * Math.sin(theta) +
vertex[0][1] * Math.cos(theta);
Using Abstraction to Create

function getNextCoordinate(curr, vert, plotRatio) {
    // add to the current coordinate the plotRatio
    // of the distance to the chosen vertex
    return curr + (vert - curr) * plotRatio;
}
http://codeinthebrowser.org/image-bluescreen.html
Creating Chaos

https://sites.google.com/site/nphsrickick/Home

https://sites.google.com/site/nphsrickick/Home/cs principles/chaos
Beyond Creating Chaos

https://sites.google.com/site/nphsrkick/Home/cs_principles/beyond-chaos
Have a good evening!

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Workshop Name:
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Workshop Number:
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