Moving the Principles Course into High School

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private void createProfile(String name) {
    // Create a FacePamphletProfile with that name
    if (!database.containsProfile(name)) {
        database.addProfile(new FacePamphletProfile(name));
        canvas.showMessage("Profile created");
    } else {
        canvas.showMessage("The profile for "+ name + " already exists");
    }
    currentProfile = database.getProfile(name);
}

private void deleteProfile(String name) {
    // Delete the user named in name box to the left
    // Removes as a friend from everyone who s/he is friends with
    if (database.containsProfile(name)) {
        database.deleteProfile(name);
    }
}
Big Ideas
(abstract version)

1. Computing -> innovation & exploration
2. Abstraction
3. Data & Information -> Knowledge
4. Algorithms
5. Programming
6. Systems & automation
7. Computing -> Innovation in other fields
Computing is a creative activity that engenders innovation & exploration

- Timeline of technology with timeline of student families on top of it
- Investigation into how new media has changed the art world, communication, etc.
- Data mining
- Wordle
- Discussions around the assumptions made by artifact designers & artifact users
Fractal Art
Models of Pizza
Abstraction reduces detail to solve problems

- Models & Simulations
- Natural language processing
Weather modeling

San Francisco Average Temperatures

Chicago Average Temperatures

Weather Predictions

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Data from www.weather.com
Data and information facilitate the creation of knowledge

- Digitizing data
- Excel spreadsheets
Digitizing Data
Algorithms express solutions to computational problems

- Create algorithms. Use different levels of abstraction
- Discussion: what problems are computers good at solving? What are they bad at solving? What can computers not do?
- Compare algorithms for solving the same problem
Imagine you are a judge at an egg drop contest…

- **Solution 1:** Drop the first contraption from 1 inch. If the egg does not break, drop it from 2 inches, and then 3 inches, etc., until it breaks. Record the last height before the egg breaks.

- **Solution 2:** Drop the first contraption from 128 inches. If the egg does not break, drop it from 192 inches, and then 224 inches, etc., increasing the height by half of the remaining distance to the top each time. When the first contraption breaks, begin dropping the second contraption at a height one inch greater than the height from which the first one did not break, working your way to the height on which the first contraption broke. (So if the first contraption broke at 224 inches high, you would drop the second contraption from 193 inches, then 194 inches, then 195 inches, up to 223 inches.) Record the last height at which the egg was successfully dropped before it broke.

- **Solution 3:** Drop the first contraption from 16 inches high. If it does not break, drop it from 32 inches, then 48 inches, and so on, increasing by 16 inches each time. When the first contraption breaks, begin dropping the second one at a height one inch greater than the height from which the first one did not break, working your way to the height where the first contraption broke. (So if the first contraption broke at 48 inches, drop the second contraption from 33 inches, then 34 inches, then 35 inches etc. up to 47 inches.) Record the last height at which the egg was successfully dropped before it broke.
Programming produces computational artifacts

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Devices, systems, networks... automate computational solutions

- Cloud computing
- Parallelization
- How the internet works
- Decision trees
Computing enables innovation in other fields

- Big Data
- Bioinformatics & gene sequencing

“You might also like…”
Research how computing intersects with a field you want to study or work on
Conclusion