Beyond Basics: Coding Workshops for Middle School Girls

Week-long Summer Workshop 2018
(Note: this is a plan - we had to be flexible and move things around based on time and participant interest)

DAY 1: HTML BASICS

Items needed:
- Blindfolds
- Handful of different colored markers
- Table
- Timer
- Snacks
- HTML Basics handouts
- Example programs

12:00  Icebreaker  20 min
Girls give directions to blindfolded individual(s) to draw shapes on the Whiteboard. They must give specific directions to help locate colors and draw a specific shape. Discussion about how this relates to giving specific directions to a computer and how it might be to be color blind.

12:15  Intro to HTML  20 min
Introduce HTML basics including template, paragraphs, creating list items, and the procedure for saving and testing web pages locally.

12:35  Hyperlinks  20 min
Introduce hyperlinks and the use of multiple pages.

12:55  Images  25 min
Introduce images both as static pictures and as links to another page.

1:20  Snack break  15 min

1:35  Colors, Buttons, Marquees  30 min
Introduce text coloring, buttons as links, and marquees to make things move (We added marquees for flexibility, but did not have time to cover them)

2:00  Guest Speaker:  40 min
Professor talks about his work in speech-to-text and word prediction

2:40  Challenge: Make a retro website  Until end of day
Give examples of web pages from the ‘90s. Explain some elements of design. Girls program their website for the remainder of the day.
DAY 2: CSS & JAVASCRIPT

Items needed:
- CSS handouts
- Javascript handouts
- Website for color-blind effect
- Snack

Start with 30 min website challenge to create something colorful then proceed with day schedule as originally planned.

12:00   Color-blindness & the Web  15 min
Discuss the impact of color-blindness on people who use the web

12:15   Test their Websites from Yesterday  20 min
Show them how to view their web pages and upload them to check.
Discuss what to change, and how this impacts how websites look today.

12:35   CSS Basics  35 min
Show the basics of background colors, fonts, text color, and different sections.
Time to experiment.

1:20    Javascript  30 min
Show how it can be used to change style-sheets and color on a web page.
Show how to hide a part of a web page.
Time to experiment.

1:50    Snack time  15 min

2:15    Work on websites  Until end of day
Girls have time to experiment and add to their websites.
Girls put their web pages live on the server.
DAY 3: MOBILE AND USABILITY TESTING

Items needed:
- Sunglasses
- Tape
- Rubber bands
- Phones
- Cooler with ice (optional)
- Snack
- Additional HTML/CSS references
- Crayons and paper

12:00  Test out Websites on phones  30 min
Girls work in pairs to see what it is like to try to use a smartphone screen with limited manual dexterity (tape over fingertips, rubber bands around fingers) and blurry up-close vision (fogged-over sunglasses).

12:30  Discuss changes to make, how things can be better designed  10 min

12:40  Make changes using Bootstrap  40 min
Show how to change font sizing and style for eyesight and size for tap-ability
Girls have chance to keep working on websites
Buttons & Navbar/header
Grid layout

1:20  Snack  20 min
Snack and share websites for constructive criticism

2:40  Final adjustments  Until end of day
Girls make final adjustments to web pages, add any extras, update the server
DAY 4: PROCESSING GAME DESIGN - 2D ONLY

Items needed:
- Processing booklets
- Handouts: bouncing ball, state machine, colors/random colors, clickable screen
- Crayons and paper
- Snacks

12:00   Intro to Processing  90 min
Easter Eggs (clicking to generate a randomly colored “egg” shape on the screen)
Rectangle Key Pressed (moving a rectangle with key control)
Bouncing Ball (ball is animated to bounce on the edge of the screen)

1:10   Game design - brainstorming  15 min
Girls brainstorm ideas
Introduce idea of state changes
Give ideas of achievable level, eg. pong, simple quiz, etc.

1:25   Start programming  20 min

1:45   Snack Break  15 min

2:00   Guest speaker  30 min
Talk about UX strategies and applying them to websites

2:30   Design time  Until end of day
Girls design a game, preferably pair programming
DAY 5: CONNECT PROCESSING TO HTML & MAKEY MAKEY

Items needed:
- Processing embedding in web handout
- Tinfoil
- Scissors
- Markers
- Tape
- Cardboard
- Makey Makey

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<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Duration</th>
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<tbody>
<tr>
<td>12:00</td>
<td>Embed Processing in HTML</td>
<td>30 min</td>
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<tr>
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<td>Show how to embed processing game from the day before into an HTML page</td>
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<td>Girls update their websites.</td>
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<td>(Did not happen due to IT issues)</td>
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<tr>
<td>12:30</td>
<td>Guest Speaker</td>
<td>45 min</td>
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<td>Software engineer talks about making video games for people who are blind.</td>
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<td>1:15</td>
<td>Start designing controls for Makey Makey</td>
<td>45 min</td>
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<td>Plan controls to be useful for people with limited manual dexterity</td>
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<td>2:00</td>
<td>Snack break</td>
<td>15 min</td>
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<tr>
<td>2:15</td>
<td>Continue designing controls for Makey Makey</td>
<td>60 min</td>
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<td>3:15</td>
<td>Review and discussion</td>
<td>15 min</td>
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<td>Girls share their control designs with the others and discuss common features and differences implemented for specific users.</td>
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DAY 6: GAME JAM

Items needed:
- Paper, pencils, crayons, markers
- Whiteboards, whiteboard markers
- Scissors, tape, tinfoil, cardboard
- Extra copies of handouts from the week
- Snacks
- Lunch passes

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<th>Time</th>
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<tr>
<td>9:00</td>
<td>Intro &amp; Brainstorming</td>
<td>15 min</td>
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<td>Discuss ideas and options for today</td>
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<td>Continue Thursday’s game</td>
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<td>Start a new game</td>
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<td>Expand their web page</td>
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<td>Talk about reasonable scale to achieve</td>
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<tr>
<td>9:15</td>
<td>Start programming</td>
<td>1 hr 15 min</td>
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<td>10:30</td>
<td>Snack break</td>
<td>15 min</td>
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<tr>
<td>10:45</td>
<td>Return to programming</td>
<td>1 hr 15 min</td>
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<tr>
<td>12:00</td>
<td>Lunch</td>
<td>1 hr</td>
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<tr>
<td>1:00</td>
<td>Return to programming</td>
<td>1 hr 40 min</td>
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<td>2:40</td>
<td>Cleanup</td>
<td>20 min</td>
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<td>3:00</td>
<td>Presentations</td>
<td>1 hr</td>
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<td>Parents arrive and girls share their work</td>
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<td>Give certificates of completion to girls</td>
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<td>4:00</td>
<td>End</td>
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