

# Patch-Ed

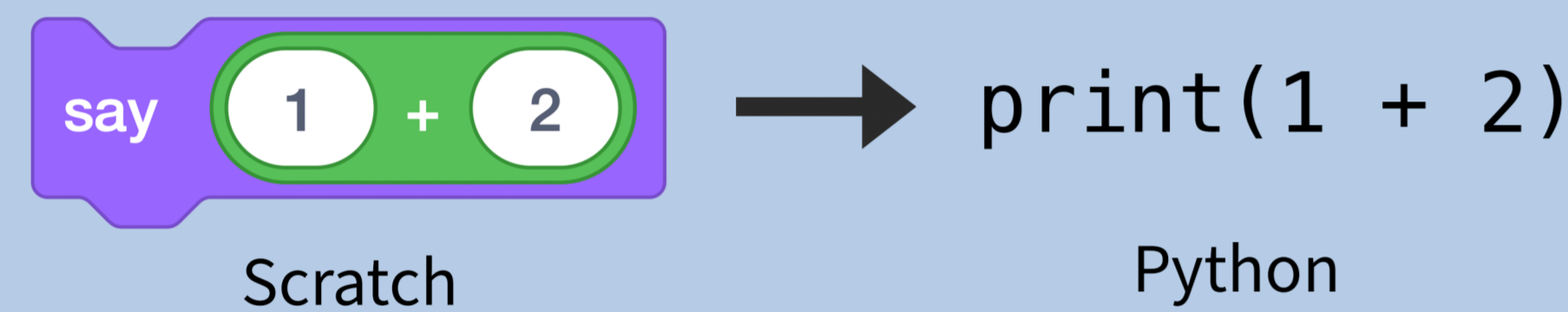
creating curricula to effectively transition young computer science students from block-based to text-based programming

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Research Timeline  
Summer 2023

How can I create a curriculum that...

... seamlessly transitions Scratch knowledge into Python?



... allows for student agency and freedom earlier when learning Python?

... is fun and engaging for students?

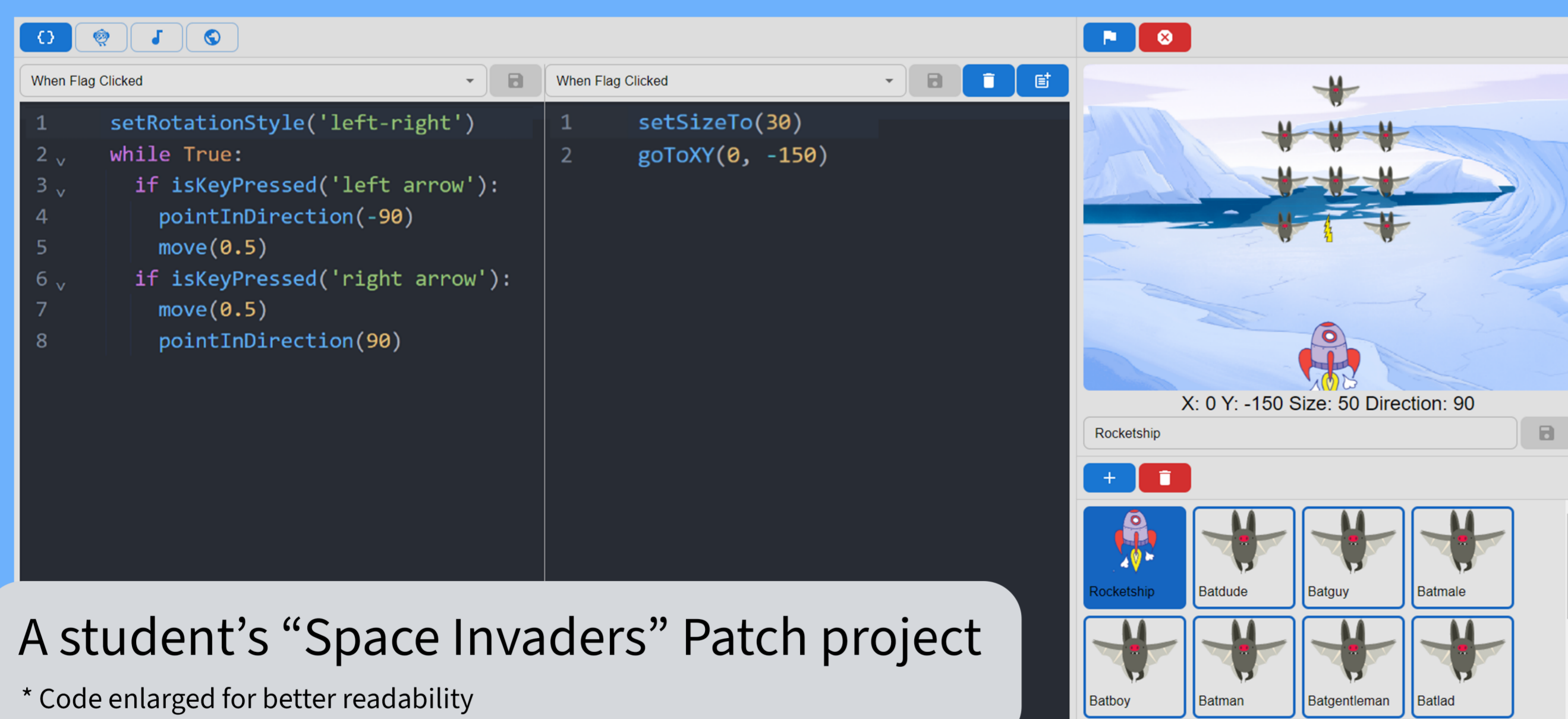


Patch the Penguin

## Patch

Patch is a coding platform designed to be a midpoint between Scratch and Python that helps students bridge the gap between block-based and text-based programming languages.

Patch is free and open-source. CodePatch.org



A student's "Space Invaders" Patch project

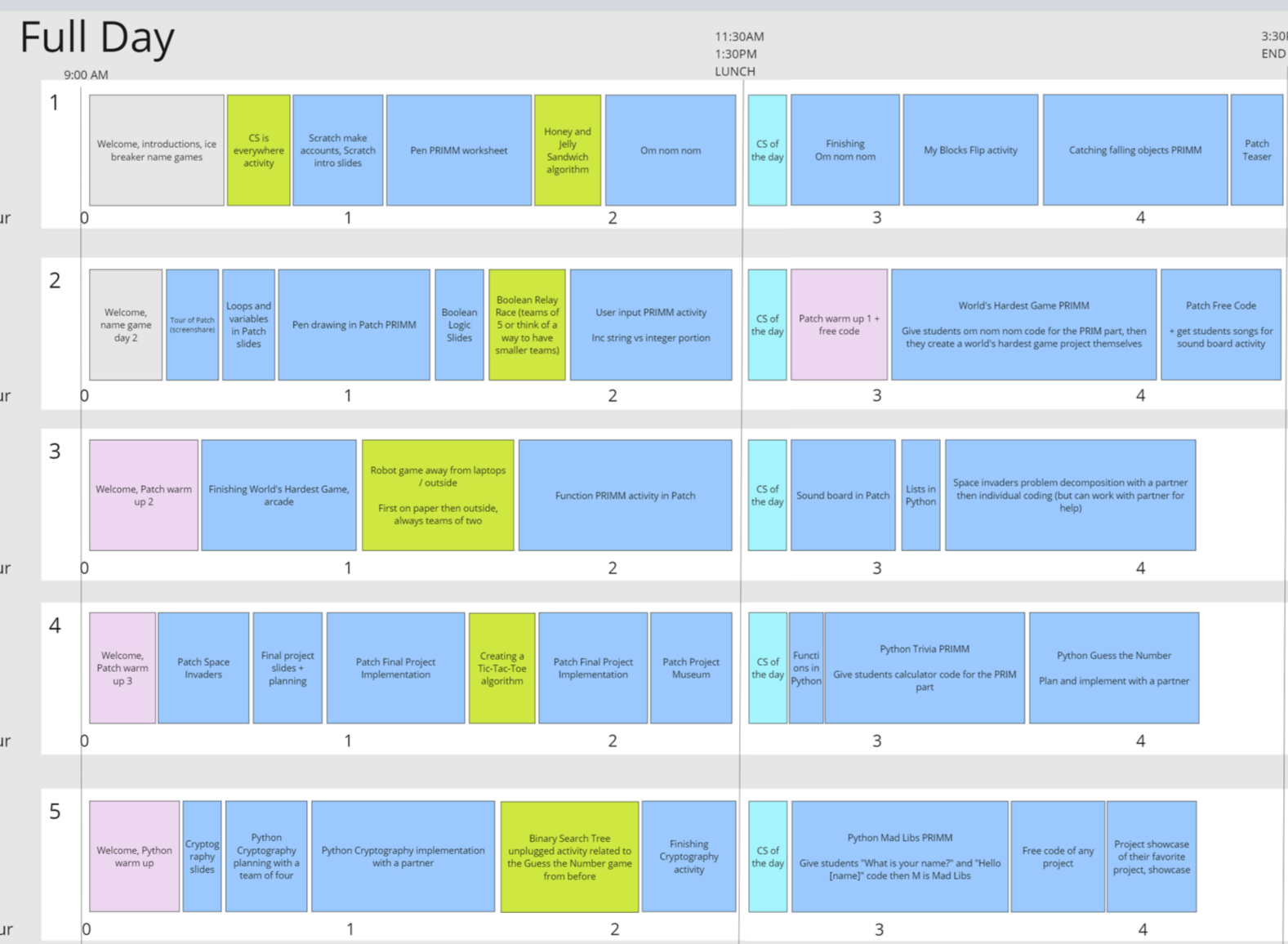
\* Code enlarged for better readability

## Pedagogy Research

Expert	Topic
Dr. Karen Brennan, Harvard University	Read two papers on student self-directedness
Dr. Chelsea Andrews, Tufts University	Watched a presentation on supporting students' failures
Dr. Sue Sentance, Dr. Jane Waite, and Dr. Maria Kallia, King's College London	Read a paper about the PRIMM (Predict, Run, Investigate, Modify, and Make) lesson structure
David Zabner, Tufts PhD student studying STEM Education	Discussed the Use-Modify-Create and PRIMM lesson structures
Dr. Ethan Danahy, Tufts University	Met daily to discuss curriculum strategies and development

## Workshop Two (July)

In July, I improved and iterated upon my half-day curriculum to create a curriculum for a full-day, week-long workshop for ages 11-14.



I taught the second curriculum to 15 students at a BX Coding workshop, again taking notes to improve the curriculum for public release.

### Curriculum Chart Guide

- Core Lessons
- Unplugged Activities
- Warm-up Activities
- Introductions
- Historical Computer Scientist Spotlight

## Workshop One (June)

In June, I created an initial curriculum for a half-day, week-long Python workshop for ages 11-14.

### Half Day

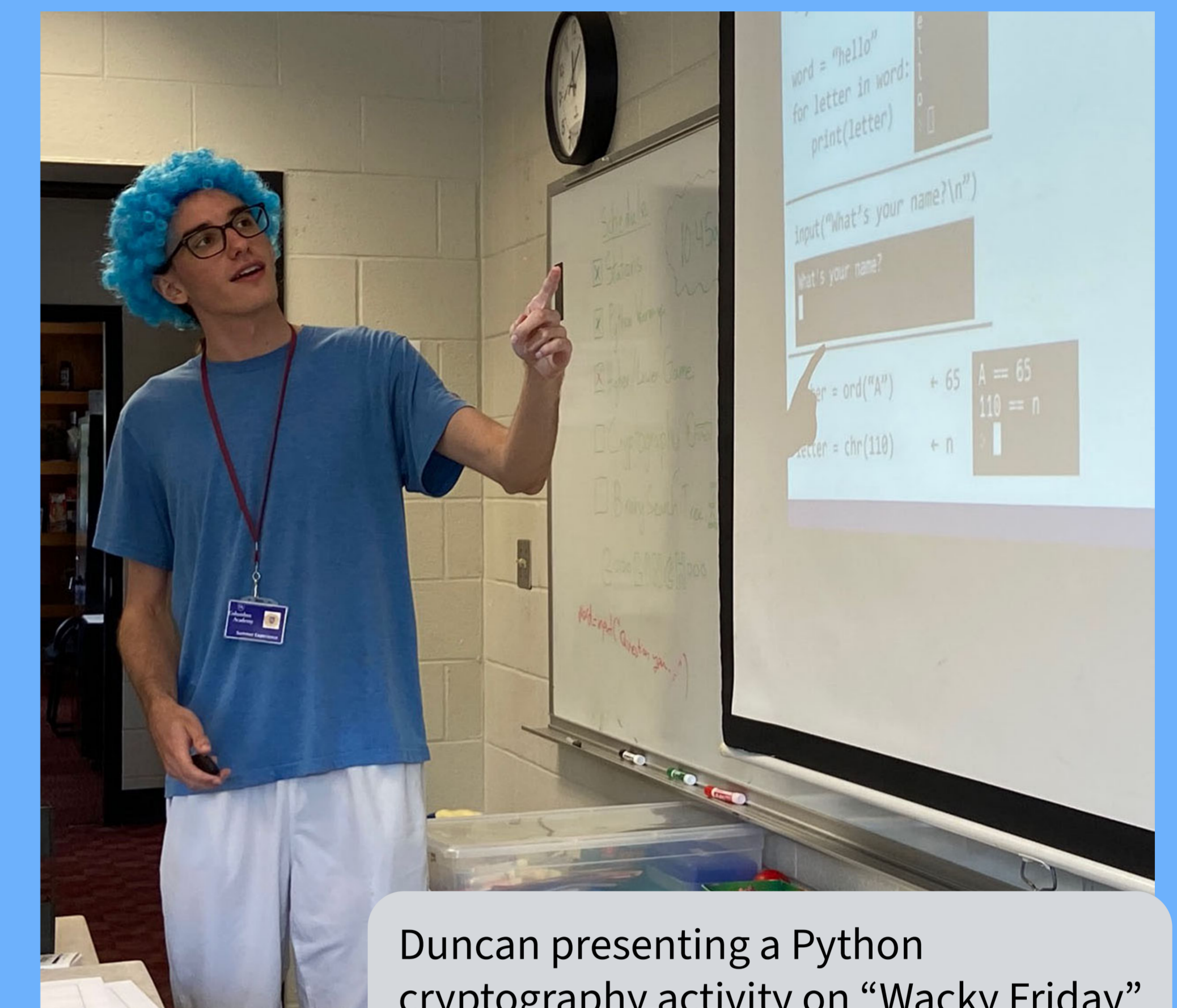


I taught the curriculum to 11 students at a workshop operated by my nonprofit BX Coding, taking notes to improve upon the curriculum for workshop two.

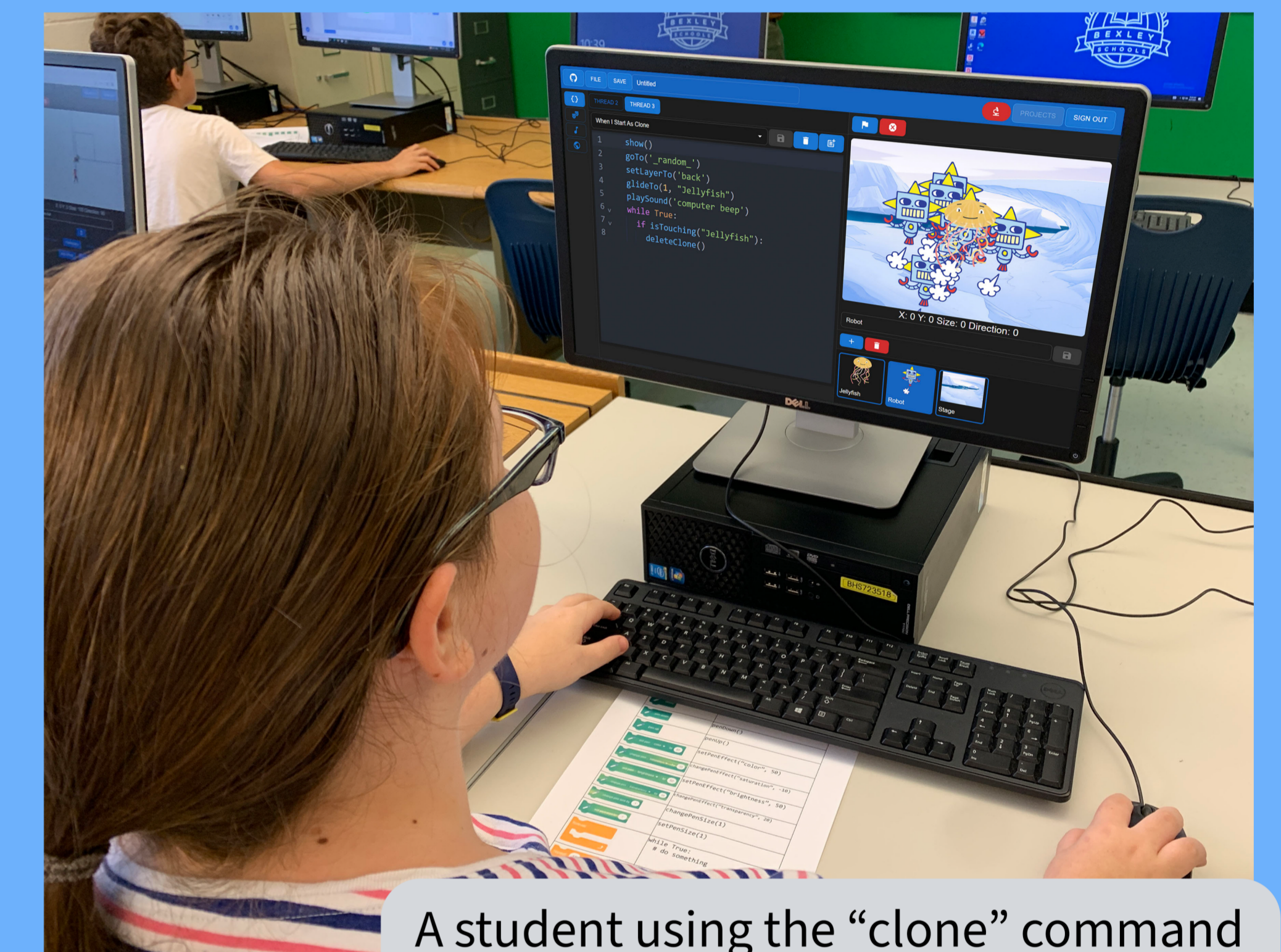
## Next Steps

I'm working to compile the curriculum and host it on patch-ed.org. I'll provide teachers with lecture slides, student worksheets, and instructor guides so they can implement my lessons in their classroom. Since Patch and the Patch-Ed curriculum are free, accessibility is high.

Next summer, I'm going to travel internationally and teach the Patch-Ed curriculum in coding workshops for students from communities in need.

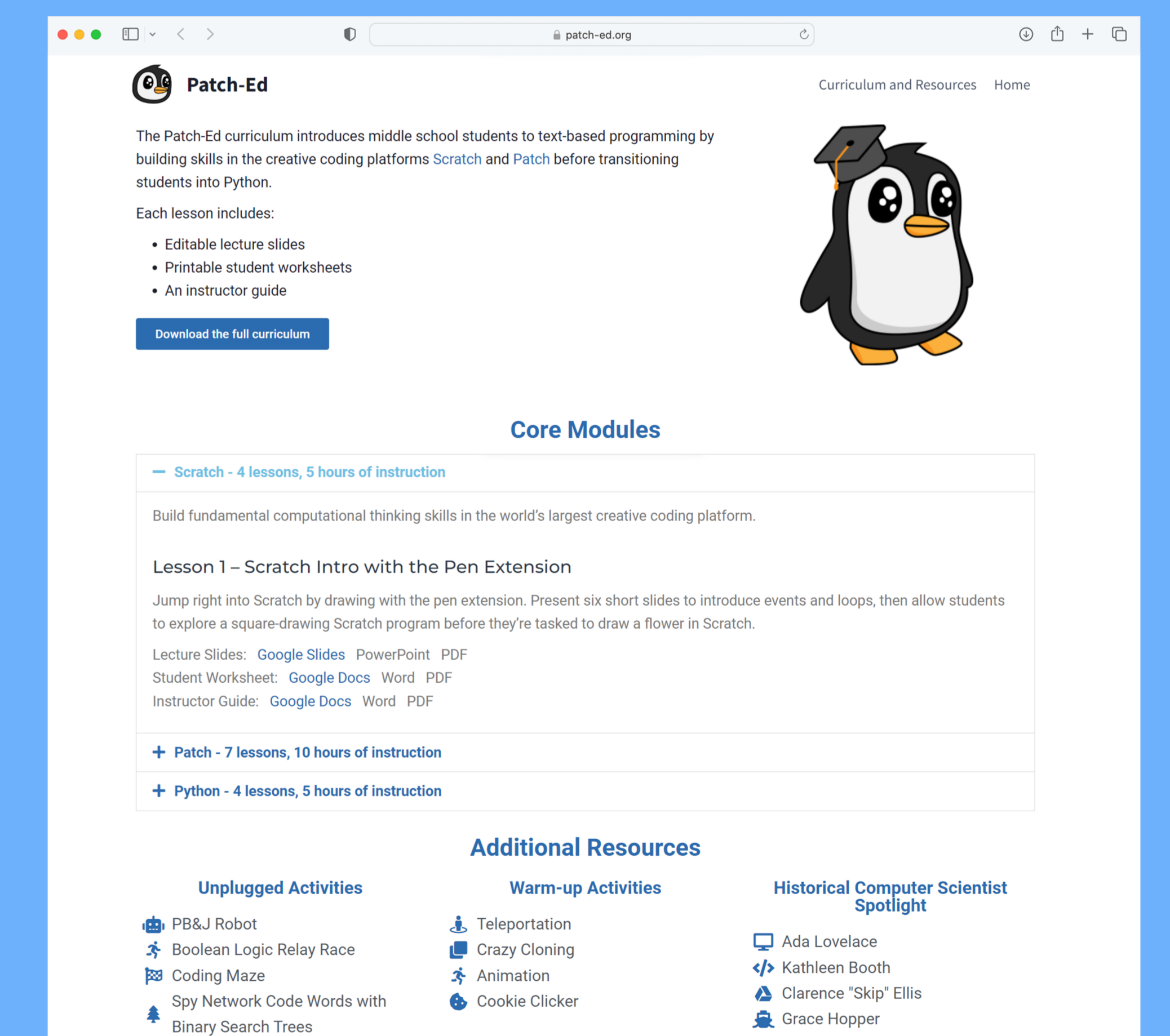


Duncan presenting a Python cryptography activity on "Wacky Friday"



A student using the "clone" command in Patch to create dozens of robots

\*Screen image replicated to achieve a higher resolution



Patch-Ed.org