Nifty Assignment Submission: Digital Coloring Book

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**An Intro**: This assignment is pretty straightforward: students are tasked with creating their own page for one of those Grown-Up Coloring Books with crazy intricate designs. I’ve used this assignment for the last 3 years in my Computer Science Principles class that uses AppLab and one year in my intro CS class that uses p5js. I originally created this assignment because I wanted students to pause and become fluent in the bare-bone commands of a visual language without saying “make anything you want!” because then students get overwhelmed with their own ideas - half the students finish too quickly while the other half never finish because their ideas are so grand. I’ve had success with this project because it sets some natural restrictions (no color, colorable) that forces students to focus on the bare-bones commands of the language, but still lets students have creative freedom and feel like they can “make whatever they want” - it has a low floor but a high ceiling.

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| Summary | * Assignment has students create a design that will become part of a class Coloring Book. Materials include a project overview, rubric, and reflection questions that can be tailored to an individual classroom. Previous submissions [here](https://padlet.com/dschneider10/coloringbook2018) and [here](https://padlet.com/dschneider10/coloringBook). |
| Topics | * Depending on when it’s used in curriculum, the project can emphasize functions & design paradigms; functions with parameters; loops; and randomness. * Depending on the language being used, different drawing commands can be emphasized (for example, with processing, this could be an appropriate project to experiment with curves and Bezier curves) * Some of the social / collaborative aspects of coding can be emphasized, such as feedback and documentation. |
| Standards | * 2-AP-13: **Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.** * **2-AP-14: Create procedures with parameters to organize code and make it easier to reuse.** * **2-AP-19: Document programs in order to make them easier to follow, test, and debug.** * **3A-AP-18: Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.** * **3A-AP-19: Systematically design and develop programs for broad audiences by incorporating feedback from users.** |
| Audience | * Middle School or High School students would enjoy the theme of this activity - appropriate for either age group. * Classes that use a language that allows for visual design (Scratch, AppLab with Turtle, Logo, Python with Turtle, Processing / p5js, etc) |
| Difficulty | * Difficulty is scalable, depending on the requirements that the teacher wants to impose. * I’ve done this project using 3 days in-class with some structured feedback / reflection time built-in |
| Strengths | * IMO, This assignment works well in the *middle* of a unit, when students are still developing fluency with the arsenal of commands available to them but aren’t necessarily ready to think analytically about those tools yet - still need time to play. * Emphasizes Creativity; low floor -> high ceiling. * Emphasizes ownership & collaboration - everyone contributing to a physical class coloring book is very motivating * The ‘coloring book’ aspect of this assignment strikes an important balance of letting students be creative in *thinking* about color, but restricts them from actually *using* (and thus getting distracted) by color. |
| Weaknesses | * Students may set their sights ‘too big’ and not end up with a viable design * Requires some extra time outside of class to organize images and create the coloring book |
| Dependencies | * Functions & some kind of program-design paradigm (such as top-down design) |
| Variants | * This assignment doesn’t assume students have seen loops, randomness, or functions with parameters - these can be incorporated later. * This project could be extended to physical computing classrooms where students design the *actual* turtle robot to draw the designs they’ve created - [something like this](https://twitter.com/MathyMcMatherso/status/1101574508282953728) |