Hands-on (Unplugged) Exploration of Computer Science

Compiled by Sam Jordan, Alaska Department of Education & Early Development, 2018. With November 2019 edits by Daniel Cornwall, Alaska State Library.

Getting students interested in coding doesn't have to involve screens! Check out this list of fun activities to do.

1. Take apart a computer: Find an old computer or laptop, bring in some screwdrivers and take it apart. You can also use cardboard to create your own computers or robots.
   a. Where: littlebinsforlittlehands.com/kids-take-apart-computers-upcycled-stem-activity/
2. Algorithm Treasure Hunt: Using paper, print out a picture of a treasure and arrange the papers around it. You could also create a grid using painters tape on the floor. Have students give directions orally or write it down as part of an algorithm to get someone to the treasure. Reset it by rearranging the paper.
   a. Where: jdaniel4smom.com/2016/02/coding-games-building-and-walking-an-algorithm.html
3. Creating Binary Bracelets: Coding relies on lots of patterning, so even creating simple ABAB or ABBA patterns is a great precursor activity. Use this activity to get kids to code their names on a take-home bracelet.
   a. Where: code.org/curriculum/course2/14/Teacher
4. Very Hungry Coding Caterpillar (Scroll to bottom of page): Draw or print a picture of a very hungry caterpillar and some food. Arrange them on the floor and give your students some arrow flash cards to guide the caterpillar
   a. Where: www.atlasmission.com/blog/top-5-preschool-coding-activities-give-child-that-step-up
5. Introduction to Loops: Create an obstacle course with stations arranged in a circle and no matter where students start, they will loop around to do each station in the activity. This introduces students to the coding concept of a loop, where a command is given to do the same thing over and over again.
   a. Where: www.linzeecraig.com/wp-content/uploads/2014/06/Obstacle-Course-For-Teachers-Handout-Short.pdf
6. Create a Block or Lego Maze: Use blocks or legos to create a maze for a plastic figurine to navigate.
   a. Where: researchparent.com/coding-a-lego-maze
7. Design your own App: Using boxes, students can draw, color, and write to create how an application they would want to create would function.
   a. Where: docs.google.com/document/d/1UE3nIhlDkD8-6fdSQX8qHI-URxFgwTLABSHvGHGh870/edit
8. Pixel Art: Print out graph paper and color in the blocks, use post-it notes, or have students practice cutting and pasting squares onto paper.
   a. Where: alicekeeler.com/2016/03/17/pixel-art-template/