



16: Data and Coding

Learning Objectives

Students will learn that data on computers is information.

CSTA Standards (9)

- 1B-AP-17: Describe choices made during program development using code comments, presentations, and demonstrations.
- 1B-AP-15: Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.
- 1B-AP-12: Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.
- 1B-AP-11: Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
- 1B-AP-10: Create programs that include sequences, events, loops, and conditionals.
- 1B-AP-09: Create programs that use variables to store and modify data.
- 1B-AP-08: Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
- 1B-DA-07: Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.
- 1B-DA-06: Organize and present collected data visually to highlight relationships and support a claim.

Materials Needed

- Skill Struck platform
- Computing device

Supplemental Materials

- [Data Slideshow](#)

Professional Development

View resources in Community Plus [↗](#)

Activities

Time Estimate: 50 min

- Warm-up/Wrap-up
- Demo
- Platform
- Class Activity
- Extra Activities

Name	Description
Warm-Up 5 min	Designate one side of your classroom as A and the other side of your classroom as B. Ask students to stand and follow your directions. You will read the following three “Would You Rather?” questions and ask students to move to the corresponding side of the room for each question. Would You Rather... 1. A) Be a pro sports player. B) Be a pro chef. 2. A) Eat pizza without cheese. B) Eat pizza without sauce. 3. A) Be able to fly. B) Be able to read minds. For each round, take note on the board how many students chose A and how many chose B. Consider writing these numbers on the board to not forget. Once the 3 rounds have finished, explain that these are examples of data. Data is information. It tells us things! For example, if more students in your class said they would prefer to be a pro chef you could say, “The data shows us more students would rather be a pro chef!”
Teacher Demonstration: Data Slideshow 15 min	Open the Data slideshow and review the instructions for this activity. Students will choose three options from the list and gather data from 12 different people. They should mark their peers’ responses on a piece of paper to formally collect the data. Before students collect or graph data, ask them to come up with a simple question they want to answer using data. Example: What is our class’s favorite fruit? Students will use this data they collect in the coding portion of this lesson.
Platform: Data and Coding Lesson 25 min	Students complete the Data and Coding lesson on the platform.
Wrap-Up 5 min	Check that all students have labeled their data and graphs clearly. Then, lead a brief discussion using guiding questions such as: • “What patterns do you notice in your data?” • “Based on this data, what might happen next time?” • “What does this information tell you about your classmates?” Invite students to turn and talk with a partner or share their findings with the class. Encourage them to explain what their graph shows and what conclusions they made from their data.

Activities for Further Learning



Name	Description
Extra Activities	Mini Project – Students gather data from their class or another group (e.g., favorite pets, morning routines, screen time), graph it, then write a short paragraph predicting trends and explaining what their graph shows. 3 Way Data Dash: Students use their survey data (favorite foods) to quickly build three different visual models to evaluate a claim. Step 1: Make a Claim (1 min) Have students look at their raw survey tallies and write a quick hypothesis (e.g., <i>"Watermelon is the most popular food"</i>). Step 2: 3 Quick Visuals (6 min) Students quickly organize the exact same data into three formats: The Tally Chart: Students organize their raw data by drawing a chart with three columns, using visual tally marks to group the votes for each food Whiteboard Bar Graph: Quickly sketch a simple bar graph on a whiteboard, shading the height of three columns to match the votes for each food. Whiteboard Pictograph: On the back of the whiteboard, draw a quick symbol (like a star) for each vote next to the food names to show volume. Step 3: Evaluate (3 min) Students place their screen and whiteboard side-by-side. Ask: <i>"Do all three visuals –the most jumps, the tallest bar, and the most stars–prove your claim is true?"</i> Students write a one-sentence conclusion.
Extension and Remedial Ideas	Extension Opportunity: Teachers can extend learning by having students collect cross-classroom data (e.g., surveying another grade level) and program a complex digital bar chart that grows based on the collected numbers. Students could also use the data to create three different types of physical visualizations (tally chart, bar graph, pictograph) to evaluate a hypothesis. Remedial Resources: For extra support, teachers can provide a pre-filled, "clean" dataset so students can focus solely on the programming aspect without the distraction of raw data collection. Teachers can also use physical building blocks (like Legos) to help students physically stack a representation of the data before coding it.

Print Lesson Plan

