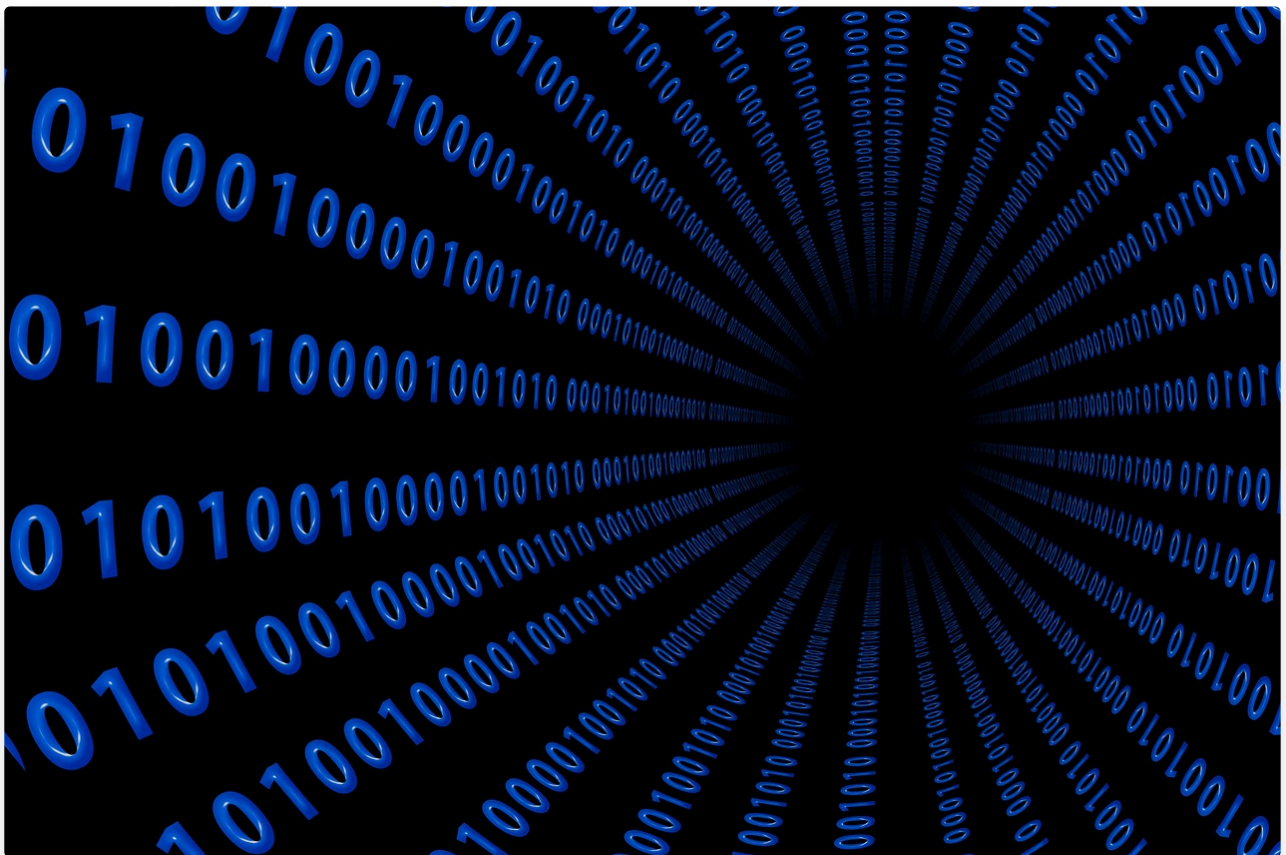


Data in Action

Textbook

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Introduction

Ever wonder how weather forecasts are made or how scientists test ideas without going into space? The answer is data—and the smart tools we use to collect, sort, and understand it. In this lesson, you'll learn how to gather data with technology, run simulations to test ideas, and use databases to solve real-world problems.

Collecting Data with Technology

Instead of writing everything down by hand, we can now use tools like sensors, surveys, and digital forms to gather data quickly and accurately. For example, students doing a science project could use temperature sensors or digital timers to collect results. You can work alone or in a team to collect and share this data to solve content-related problems—like figuring out the best time of day to water plants or how many students prefer lunch inside vs. outside.

Using Simulations to Test Ideas

A **simulation** is like a virtual experiment. It lets you test a hypothesis (your idea or prediction) without having to try it in real life. For instance, you can simulate how pollution affects fish in a river or how fast a disease might spread in a town. **Digital modeling** helps scientists, engineers, and even gamers understand how

things work before they build or try them.

Databases: Storing and Searching Smartly

A **database** is a digital place to store lots of information—like names, dates, test scores, or anything you want to organize. To make sense of it, you can use operations like **sorting** (putting it in order), **filtering** (showing only certain results), or **searching** (finding something specific). This helps you pull out the exact information you need—like finding all students who scored above 90 on a test or listing everyone with a birthday in May.

Solving Problems with Organized Data

Once your data is stored and sorted, you can use it to **solve problems**. Maybe you're trying to figure out which snack is most popular at school. You can create a survey, store the results in a database, and **choose the best graph**—like a pie chart or bar graph—to show your findings. Organized data makes it easier to see trends, compare options, and share your results in a way people can understand.

Activity

"How fast can a Hot Wheels car move? Can we collect and report data to describe its performance?"

- **Task:** Individually or in small teams, you will:
 - **Grab a toy car** and **use a timer** to measure how long it takes to travel 1 meter.
 - **Repeat** the test **3 times** to ensure accuracy.
 - **Calculate the average speed** (speed = distance ÷ time).
 - **Record the results** in a quick table or digital chart.
- **Reporting (last 2–3 minutes):**
 - Each group or student quickly **shares one observation**, such as:
 - "Our car averaged 0.5 meters per second."
 - "Run 2 was slower because the robot bumped into the tape."
 - Ask: *"How could this kind of data be helpful in the real world?"* (e.g., testing robot reliability or navigation systems)

Conclusion

From science experiments to school projects, technology helps you **collect**, **test**, and **analyze** information to make better decisions. Learning how to use simulations, databases, and graphs gives you the power to explore big questions and solve real-world problems.

Questions (5)

1. What is one benefit of using digital tools to collect data?

MULTIPLE CHOICE

Choose the correct answer:

- A. You can decorate your graphs with emojis
- B. It saves time and increases accuracy
- C. It makes your handwriting look better
- D. It keeps data hidden

2. What is a simulation used for?

MULTIPLE CHOICE

Choose the correct answer:

- A. To skip doing real work
- B. To test a hypothesis without a real-life experiment
- C. To print out charts and graphs
- D. To store information in folders

3. Which of the following is NOT a database operation?

MULTIPLE CHOICE

Choose the correct answer:

- A. Filtering
- B. Sorting
- C. Scanning
- D. Searching

4. Why might you use a graph after organizing data in a database?

MULTIPLE CHOICE

Choose the correct answer:

- A. To hide the information
- B. To avoid using numbers
- C. To print fewer pages
- D. To show the data in a clear, visual way

5. What is the main reason to filter data in a database?**Choose the correct answer:**

- A. To show only the information you need
- B. To delete extra data
- C. To randomize the results
- D. To make it harder to read

Answer Keys & Solutions

Questions

1. What is one benefit of using digital tools to collect data?

MULTIPLE CHOICE

Correct Answer:

- A. You can decorate your graphs with emojis ✗ Incorrect
- B. It saves time and increases accuracy ✓ Correct
- C. It makes your handwriting look better ✗ Incorrect
- D. It keeps data hidden ✗ Incorrect

2. What is a simulation used for?

MULTIPLE CHOICE

Correct Answer:

- A. To skip doing real work ✗ Incorrect
- B. To test a hypothesis without a real-life experiment ✓ Correct
- C. To print out charts and graphs ✗ Incorrect
- D. To store information in folders ✗ Incorrect

3. Which of the following is NOT a database operation?

MULTIPLE CHOICE

Correct Answer:

- A. Filtering ✗ Incorrect
 - B. Sorting ✗ Incorrect
 - C. Scanning ✓ Correct
 - D. Searching ✗ Incorrect
-

4. Why might you use a graph after organizing data in a database?

MULTIPLE CHOICE

Correct Answer:

- A. To hide the information ✗ Incorrect
- B. To avoid using numbers ✗ Incorrect
- C. To print fewer pages ✗ Incorrect
- D. To show the data in a clear, visual way ✓ Correct

5. What is the main reason to filter data in a database?

MULTIPLE CHOICE

Correct Answer:

- A. To show only the information you need ✓ Correct
- B. To delete extra data ✗ Incorrect
- C. To randomize the results ✗ Incorrect
- D. To make it harder to read ✗ Incorrect