

Presenting Data

Textbook

Presenting Data



Effectively sharing your findings often involves presentation software. These tools (like Google Slides, PowerPoint, Keynote) help you combine text, images, charts, and videos into structured, visual slides.

Data for presentations can come from various computing devices:

- **Probes and Sensors:** Physical devices (e.g., temperature sensors) collect real-world data.
- **Software Tools and Programs:** Digital sources like surveys or simulations generate data.
- **Handheld Devices:** Smartphones can collect data via their built-in sensors.

Raw data is best understood through **data visualization**, which transforms numbers into charts, graphs, and maps. Interactive visualizations allow users to explore data further. Common types include bar charts (comparisons), line graphs (trends), pie charts (parts of a whole), and scatter plots (relationships). You can create these using spreadsheet programs or online tools like **ChartGo** (www.chartgo.com). When analyzing visualizations, look for trends, outliers, comparisons, and draw conclusions about the data's story.

Creating a Digital Artifact

A "digital artifact" is any creation made with digital tools (e.g., a document, presentation, video, app). The process of creating a good digital artifact involves:

- **Collaboration:** Working with others on brainstorming, tasks, and reviews.

- **Reflection:** Critically thinking about your work and seeking feedback.
- **Analysis:** Examining components and understanding how they function.
- **Iteration:** Repeating steps and making improvements based on reflection and analysis until the artifact is polished.

Publishing Information for a Variety of Audiences

Sharing your work means publishing it online. Digital tools for publishing include sharing documents directly, using presentation platforms, website builders (e.g., Google Sites, Wix), or social media/blogs.

It's crucial to tailor your content for your audience (e.g., formal for teachers, simple for the general public). Using media-rich resources like images, videos, audio, and interactive elements makes your published information more engaging and easier to understand.

The Influence of Collaboration on Software Design

Collaboration significantly shapes software projects by bringing diverse ideas, shared expertise, and improved problem-solving.

Feature	Individually Designed Project	Collaboratively Designed Project
Ideas/Creativity	Limited to one person's vision.	Broader range of ideas.
Workload	All tasks fall on one person.	Work is distributed.
Quality/Bugs	Errors might be overlooked.	Multiple reviewers improve quality.
Skill Set	Limited to individual's expertise.	Combines various skill sets.

Collaborative projects often result in more sophisticated, robust, and higher-quality software artifacts due to collective intelligence and effort.

Strengths and Weaknesses of Collaboration

The collaborative process brings many strengths, such as diverse ideas, shared workload, quicker problem-solving, and enhanced quality through varied perspectives and feedback. However, it can also suffer from weaknesses like communication breakdowns, disagreements, differing work styles, or a lack of clear leadership, sometimes leading to slower progress than individual work. Maximizing collaboration's benefits requires strong communication, defined roles, and mutual respect.

Real-World Examples: Individual vs. Collaborative Software Projects

To better understand the impact of collaboration, let's look at some real-world software projects:

Individual Software Project Example:

- **A Personal Expense Tracker App:** A single developer might create a simple mobile app for themselves or a small group of friends to track daily expenses. They would design the user interface, write all the code for adding, categorizing, and viewing expenses, and manage the data storage. This project's scope is typically limited by one person's time and skills, and all decisions, from features to bug fixes, rest solely with that individual.

Collaborative Software Project Example:

- **Developing a Major Operating System Update (e.g., a new version of Windows or macOS):** This is a massive undertaking involving thousands of engineers, designers, testers, and project managers across multiple teams.
 - **Teams:** Dedicated teams work on specific components like the user interface, file system, networking, security, and application compatibility.
 - **Designers:** Collaborate to ensure a consistent user experience across the entire system.
 - **Developers:** Write millions of lines of code, using sophisticated version control systems (like Git) to manage changes from hundreds or thousands of contributors simultaneously. Code reviews are essential to maintain quality.
 - **Testers:** Work continuously to identify and report bugs, often using automated testing frameworks.
 - **Project Managers:** Coordinate efforts across teams, manage timelines, and resolve conflicts.

Project: Data Storytelling for Our Community

This project applies all skills learned: gathering and presenting data, creating a digital artifact, collaborating, and publishing for an audience.

Project Goal: Work with a small group (2–3 students) to identify a local community issue, gather data, create visualizations, and present findings in a digital report published for a specific audience.

Steps:

1. **Form Group & Choose Topic (Collaboration):** Brainstorm a local issue (e.g., recycling, school lunch preferences) and define a clear question. Assign roles.
2. **Gather Data (Computing Devices & Software Tools):** Collect primary data (e.g., online survey via Google Forms, simple sensor data, smartphone observations) or secondary data from reliable online sources. Organize in a spreadsheet.
3. **Analyze and Visualize Data (Interactive Data Visualizations):** Analyze patterns in your data. Create at least two different charts/graphs using a spreadsheet program or **ChartGo** (www.chartgo.com). Aim for visual appeal and clarity. Consider making them interactive if possible.
4. **Create Your Digital Report (Digital Artifact, Reflection, Analysis, Iteration):** Develop a presentation (e.g., Google Slides) summarizing your project, integrating your visualizations. Collaborate on the presentation, reflect on its effectiveness, analyze its components, and iterate on revisions.
5. **Publish Your Report (Publishing for Audience & Media-Rich Resources):** Define your target audience (e.g., classmates, community leaders) and tailor your content. Publish your presentation online (e.g., link, embedded on a simple website like Google Sites). Ensure it's media-rich with images, videos, or audio.
6. **Assess Collaboration (Assessment of Collaboration):** Discuss how collaboration influenced your report's design and development, comparing it to an individual effort.

Critical Thinking Questions

- The text describes how a team develops a major operating system update, highlighting different roles like designers, developers, and testers. How would the quality and overall success of such a complex software project be negatively impacted if a significant group of these roles failed to collaborate effectively?

- When creating a "digital artifact" like the community data report, the text emphasizes "iteration" and "reflection." Why is it more critical for a group creating a digital report to go through multiple rounds of reviewing and refining their work (iteration) than if they were simply collecting data individually?
- Imagine you're presenting data about school recycling habits. Why might a pie chart be effective for showing what *percentage* of waste is recycled, while a line graph would be better for showing how recycling rates have *changed over time*? Explain how the choice of visualization impacts the clarity of the conclusion you can draw.

Questions (5)

1. A student is creating a presentation to show the different categories of school waste (paper, plastic, organic) as parts of a whole. Which type of data visualization would be most effective for this purpose?

MULTIPLE CHOICE

Choose the correct answer:

- A. Bar chart
- B. Line graph
- C. Pie chart
- D. Scatter plot

2. A student has collected data on local temperatures over a month using a temperature sensor. They want to create a visualization that clearly shows how the temperature changed day by day. Which type of data visualization should they use?

MULTIPLE CHOICE

Choose the correct answer:

- A. Pie chart
- B. Bar chart
- C. Line graph
- D. Scatter plot

3. When creating a 'digital artifact' like the community data report, the text emphasizes 'iteration' and 'reflection.' Why is it more critical for a group creating a digital report to go through multiple rounds of reviewing and refining their work (iteration)

MULTIPLE CHOICE

Choose the correct answer:

- A. Iteration is only necessary for individual projects, not group projects.
- B. Group work always has more errors than individual work, so iteration is mandatory.
- C. Multiple perspectives from group members provide varied feedback, requiring iteration to integrate improvements and ensure collective quality.
- D. Individual data collection does not require any review or refinement.

4. A group is trying to identify a local community issue for their 'Data Storytelling' project. The passage states that collaboration brings diverse ideas and shared expertise. How does brainstorming as a group at this initial stage contribute to the project'

MULTIPLE CHOICE

Choose the correct answer:

- A. It limits the ideas to only the most obvious ones.
- B. It ensures that one person's vision dominates the project.
- C. It allows for a broader range of creative ideas and helps define a clearer question by combining different perspectives.
- D. It makes the initial stage of the project slower and less efficient.

5. You are analyzing data about school recycling habits. You want to show how recycling rates have changed over the past five years. Based on the passage's explanation of data visualization types, which chart would be most effective for this task?

MULTIPLE CHOICE

Choose the correct answer:

- A. Pie chart
- B. Bar chart
- C. Line graph
- D. Scatter plot

Answer Keys & Solutions

Questions

1. A student is creating a presentation to show the different categories of school waste (paper, plastic, organic) as parts of a whole. Which type of data visualization would be most effective for this purpose?

MULTIPLE CHOICE

Correct Answer:

- | | |
|-----------------|-------------|
| A. Bar chart | ✗ Incorrect |
| B. Line graph | ✗ Incorrect |
| C. Pie chart | ✓ Correct |
| D. Scatter plot | ✗ Incorrect |

Explanation:

Consider which chart type visually divides a total into proportional slices.

2. A student has collected data on local temperatures over a month using a temperature sensor. They want to create a visualization that clearly shows how the temperature changed day by day. Which type of data visualization should they use?

MULTIPLE CHOICE

Correct Answer:

- | | |
|-----------------|-------------|
| A. Pie chart | ✗ Incorrect |
| B. Bar chart | ✗ Incorrect |
| C. Line graph | ✓ Correct |
| D. Scatter plot | ✗ Incorrect |

Explanation:

Consider which graph type is best for showing how something changes continuously.

3. When creating a 'digital artifact' like the community data report, the text emphasizes 'iteration' and 'reflection.' Why is it more critical for a group creating a digital report to go through multiple rounds of reviewing and refining their work (iteration

MULTIPLE CHOICE

Correct Answer:

- A. Iteration is only necessary for individual projects, not group projects. ✗ Incorrect
- B. Group work always has more errors than individual work, so iteration is mandatory. ✗ Incorrect
- C. Multiple perspectives from group members provide varied feedback, requiring iteration to integrate improvements and ensure collective quality. ✓ Correct
- D. Individual data collection does not require any review or refinement. ✗ Incorrect

Explanation:

Think about the added complexity and benefit of multiple people contributing to and reviewing a shared creation.

4. A group is trying to identify a local community issue for their 'Data Storytelling' project. The passage states that collaboration brings diverse ideas and shared expertise. How does brainstorming as a group at this initial stage contribute to the project'

MULTIPLE CHOICE

Correct Answer:

- A. It limits the ideas to only the most obvious ones. ✗ Incorrect
- B. It ensures that one person's vision dominates the project. ✗ Incorrect
- C. It allows for a broader range of creative ideas and helps define a clearer question by combining different perspectives. ✓ Correct
- D. It makes the initial stage of the project slower and less efficient. ✗ Incorrect

Explanation:

Consider how multiple minds working together impact the generation of ideas.

5. You are analyzing data about school recycling habits. You want to show how recycling rates have changed over the past five years. Based on the

passage's explanation of data visualization types, which chart would be most effective for this task?

MULTIPLE CHOICE

Correct Answer:

- | | |
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| A. Pie chart | ✗ Incorrect |
| B. Bar chart | ✗ Incorrect |
| C. Line graph | ✓ Correct |
| D. Scatter plot | ✗ Incorrect |

Explanation:

Think about which chart effectively illustrates progression or regression.