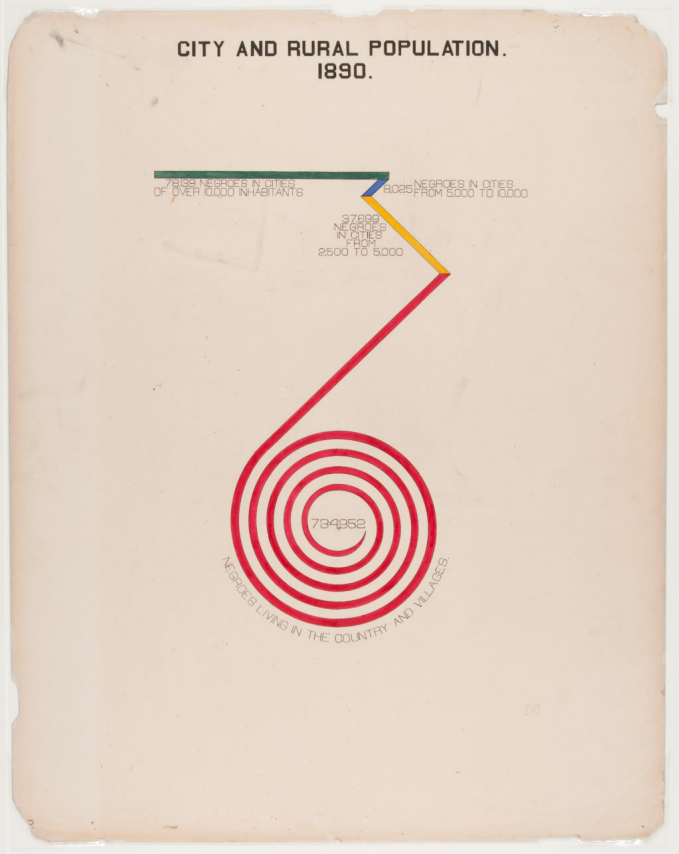
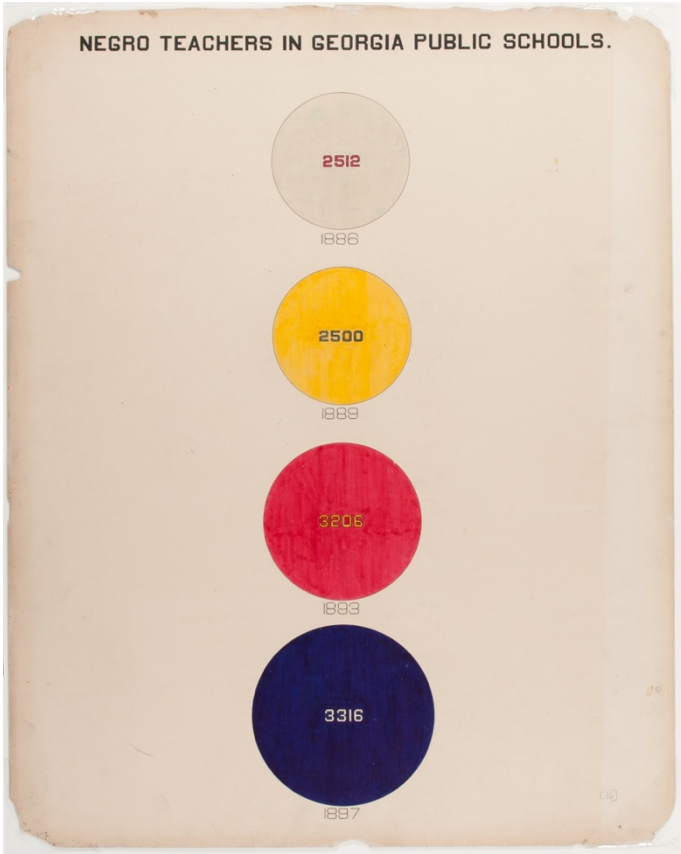
COOPER HEWITT
DESIGN
K-12

2022-2023 School Year
Updated 8/16/22

DECONSTRUCTING POWER: W.E.B. DU BOIS AT THE 1900 WORLD'S FAIR





DATA VISUALIZATIONS, W.E.B. DU BOIS. IMAGE CREDIT: LIBRARY OF CONGRESS.

A NOTE ON LANGUAGE

Language is a living and continuously changing part of our society. During his lifetime, Du Bois preferred the word "negro" over the use of other mainstream words used in the US, including "colored." However, by the 1960s the term fell out of accepted use in this country.

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WHY DESIGN?

The design process equips designers to tackle complex real-world challenges using creative, innovative, and interdisciplinary strategies.

CONTENT WILL:

- Examine how designers choose to address and impact real world problems
- Articulate how a designers' decisions affect the form and function of a design
- Illustrate how designers synthesize information and inspiration to create new design ideas
- Explain the steps of the design process and the purpose and goals for each step
- Highlight the values and mindsets of successful designers
- Consider the needs and desires of different communities and users
- Develop strategies for researching and building empathy

STUDENTS WILL:

- Define and use key design process terminology
- Collaborate with peers using verbal and visual strategies
- Develop interdisciplinary problem-solving skills
- Practice creative critical thinking
- Build advocacy/empathy competencies

LEARNING STANDARDS

Common Core State Standards (CCSS):

School Programs are developed in line with Common Core State Standards in order to facilitate the integration of key design thinking skills into a wide variety of disciplines.

Integration of Knowledge and Ideas:

- **CCSS.ELA-LITERACY.CCRA.R.7:** Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Vocabulary Acquisition and Use:

- **CCSS.ELA-LITERACY.CCRA.L.6:** Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

Comprehension and Collaboration:

- **CCSS.ELA-LITERACY.CCRA.SL.1:** Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
- **CCSS.ELA-LITERACY.CCRA.SL.2:** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

Statistics and Probability:

- **5.MD.B** Represent and interpret data
- **6.SP.B** Summarize and describe distributions
- **7.SP.B** Draw informal comparative inferences about two populations
- **HSN-Q-A.1** Reason quantitatively and use units to solve problems; choose and interpret the scale and the origin in graphs and data displays
- **HAS-REI.D.** Represent and solve equations and inequalities graphically
- **HSS-ID.A.** Summarize, represent, and interpret data on a single count or measurement variable.

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DATA, DESIGN, AND ME (4TH- 8TH GRADE)

Students will discover how designers are partnering with data scientists and researchers to translate complex facts and figures into imagery that can help everyday people better understand themselves and their communities.

KEY VOCABULARY

analysis: looking closely and making connections between all the elements of something

data: facts and numbers collected that show us information

infographic: a visual image such as a chart or diagram used to show data in a way that is easy to understand

observation: looking carefully/closely or noticing things to gain information based on something we have seen, heard, or noticed

survey: investigate the opinions or experience of a group of people by asking them questions

visualization: the representation of an object, situation, or set of information as a chart or other image

CONVERSATION GUIDE

As you discuss data visualization with your students, below are a few questions to dig into:

- What is data?
- Where do we see data in our everyday lives?
- What stories can data tell us?
- Why do you think people collect and visualize data?

HANDS-ON ACTIVITY GUIDE

OBJECTIVES

Observe

Students will make observations about their physical environment. Students will also observe their own responses to that environment.

Record

Students will record their observations and reflections through data collection.

Analyze

Students will consider their recorded observations and assess the best way to group that data to tell a story.

Communicate

Students will translate their data into a designed a visual graphic which communicates their experience or findings.

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WARM UP

Use a data visualization post-it exercises to establish key concepts and vocabulary such as design, data, and visualization.

- Gather students in a circle, with a pile of post-it notes in the center. We use the colors outlined below, but use what you have!
- Ask a series of questions and have students respond by placing a post-it on the floor that corresponds with their answer. Example questions:
    - Who has ever been to a museum? (*pink-yes, green-no*)
    - What word do you think of when you hear the word design? (yellow- architecture, red- fashion, white- graphic design, purple- something else!)
- Together, look at the data you've collected. Ask students if they can arrange the data in a way that will make it easier to understand.
- Zoom Out: Together, we've developed a visual way to represent our data. This is called data visualization.
- Have you seen data visualization before? If so, where?

LOOKING AT DATA VISUALIZATION

Look at a variety of data visualization. We recommend pulling some more straightforward examples, more creative examples, and having a range of historic and contemporary references, so students can understand that data continues to shape our lives. We recommend:

- **Refik Anadol:** a multimedia artist and designer who uses data-driven machine learning algorithms to create immersive, dream-like environments.
- **Dear Data:** an analog data drawing project by two artists Giorgia Lupi and Stefanie Posavec, where they collected and drew their personal data and sent them to each other in the form of postcards.
- **Library of Congress:** an archive of W.E.B. Du Bois's data visualizations from the 1900 Paris Exposition, all of which have been digitized in high resolution.
- **Tableau Data Kids:** a resource by Tableau, a data visualization software, that helps educators "discover new approaches to teaching young learners about data."
- **Kids Data Viz:** a compilation of articles about engaging children with data published by the Nightingale Journal of the Data Visualization Society.

DATA DESIGN WORKSHOP

COLLECT: Lightning Round Data Collection | 5 minutes

- Pass out data collection sheets
- Have students interview as many of their classmates to collect data as possible
- Play music or give some cue for when the lightning round is over. After 5 minutes, students return to their seats.

ANALYZE: Consider and understand your data | 5 minutes

- Ask students to share out what they notice about the data they collected about their class. What are similarities? What are differences? This is intended to help students analyze the data that they collected. It may be helpful to choose one way of analyzing the data as a class and walk them through a specific story that they might tell as a class based on their data.
    - Example: "We notice that x number of students in the class prefers salty food, and the same number of students prefer sports. How might we represent our classes preferences through a data visualization?"

CREATE: Create your own data story design | 20 minutes

- Once students have identified which data story is interesting to them, it's time to tell that story through design. Ask students to design a visualization of their data story on the front using colored pencils or markers.
    - Remind students to keep their data visualization clear, simple, and legible.
    - At the same time, remember that this can be creative! Think about non-traditional ways to share your data.
- Ask students to share their work: what story does your data tell us? Why did you choose to visualize it this way?

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DATA VISUALIZATION FOR CHANGE (9TH- 12TH GRADE)

Students will discover how designers are partnering with data scientists and researchers to translate complex facts and figures into imagery that can help everyday people advocate for the causes they care about. Through close looking, they will investigate how data visualization has been a powerful tool for analyzing inequities and enacting social change. In a hands-on workshop, they will have the opportunity to interpret and visualize data around important human rights issues.

KEY VOCABULARY

data: facts and statistics collected that convey information
evaluation: making of a judgment about the amount, number, or value of something
analysis: looking closely at the elements or structure of something in order to understand it better
iterate: to do something repeatedly; develop something by building upon previous versions or repetitions
infographic: a visual image such as a chart or diagram used to show information or data in a way that is easy to understand

CONVERSATION GUIDE

As you discuss data visualization with your students, below are a few questions to dig into:

- What do you think 'progress' meant to Du Bois? What does it mean to you?
- What are some tools you've noticed data designers use to visualize change?
- Why use data as a tool to advocate for things we care about?
- How does data shape the world we live in?

HANDS-ON ACTIVITY GUIDE

OBJECTIVES

Observe

Students will make observations about their physical environment. Students will also observe their own responses to that environment.

Record

Students will record their observations and reflections through data collection.

Analyze

Students will consider their recorded observations and assess the best way to group that data to tell a story.

Communicate

Students will translate their data into a designed a visual graphic which communicates their experience or findings.

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WARM UP

Use a data visualization post-it exercises to establish key concepts and vocabulary such as design, data, and visualization.

- Gather students in a circle, with a pile of post-it notes in the center (we use colors outlined below, but use what you have!)
- Ask a series of questions and have students respond by placing a post-it on the floor that corresponds with their answer. Example questions:
    - What is your café order? (*pink-tea, green-bubble tea, blue-coffee*)
- What word do you think of when you hear the word design? (yellow- architecture, red- fashion, white- graphic design, purple- something else!)
- Together, look at the data you've collected. Ask students if they can arrange the data in a way that will make it easier to understand.
- Zoom Out: Together, we've developed a visual way to represent our data. This is called data visualization.
- Have you seen data visualization before? If so, where?

LOOKING AT DATA VISUALIZATION

Look at a variety of data visualization. We recommend pulling some more straightforward examples, more creative examples, and having a range of historic and contemporary references, so students can understand that data continues to shape our lives. We recommend:

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- **Library of Congress:** an archive of W.E.B. Du Bois's data visualizations from the 1900 Paris Exposition, all of which have been digitized in high resolution.
- **Am I Normal? With Mona Chalabi:** a TED series podcast made for "endlessly curious people who question why things are the way they are. Join data journalist Mona Chalabi as she investigates the research behind tricky questions about life, society and ourselves — with the help of creative data visualizations."
- **NYT Graphics:** data visualization, maps, and other visual journalism from The New York Times Graphics Desk.

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DATA DESIGN WORKSHOP

COLLECT: Data Collection | 10 minutes

We've created a data collection worksheet you can use for a quick activity. If you'd like to extend this thinking, you can ask students to develop their own research questions based on something that interests them, or assign it as homework and ask students to collect data from their lives outside school. To do this activity in class:

- Pass out data collection sheets
- Have students interview as many of their classmates to collect data as possible. Play music or give some cue for when the lightning round is over.

ANALYZE: Consider and understand your data | 10 minutes

- Ask students what they notice about the data they collected about their class. What stories are rising to the surface? This is intended to help students analyze the data that they collected.
- What does the data tell us about the issues that matter most to us? How might we communicate this?

CREATE: Create your own data story design | 30 minutes

- Once students have identified which data story is interesting to them, it's time to tell that story through design. Ask students to design a visualization of their data story on the front using colored pencils or markers.
    - Remind students of design principles for clear and compelling communication.
    - If you have the time, asking students to sketch before adding color can be helpful. Once sketches are developed, ask students to turn to a partner and ask if they can understand the story without knowing the background information. Designers often test and evaluate their designs before putting them out into the world.

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