Data Literacy with, for, and by Youth

Activity Guide

Step-by-step instructions for six data literacy activities tested by teens

The *Data Literacy with, for, and by Youth* project is supported by a grant from the National Science Foundation (Award #2005608).

Pratt

Contents

Introduction

About the *Data Literacy with, for, and by Youth* Project

The goal of the *Data Literacy with, for, and by Youth* is to support data literacy programs for youth at the library.

In this activity guide we present a sampling of data literacy activities created and tested, alongside teen co-designers, during 24 Data Labs held at the Brooklyn Public Library. This guide was last updated in 2026 by Thalia Richter.

For more information about the project visit our website: https://sites.google.com/pratt.edu/data-activism-for-youth/home

Acknowledgements

Many thanks to the teens and librarians from Brooklyn Public Library who participated on this project.

Their contributions are invaluable.

Introduction

About Data

Data is any kind of information about you, your community, and the world. Data comes in many forms, from personal digital data to civic data created by your city, state, and country. Large computational systems gather "Big Data," which are extremely large data sets that may be analyzed by computer algorithms to reveal patterns in human behavior.

Data Literacy

Data literacy is a complex array of skills, knowledge, and humanistic reasoning to be applied throughout the data life cycle. This includes a set of dispositions that facilitate the ability to critique data practices, to contextualize data to broader contexts such as platforms, cyberinfrastructure, and society, and to find meaning in data beyond statistical and mathematical arguments. A person who is data literate tries to explain why specific actions are being taken with data, not just what and how.

Data Literacy is knowing how to read data...so that you can use data to *read the world.*

Activity Plan

Algorithms, Data and You

Overview	Teens will look at how algorithms use data to profile people. The purpose is to raise teen awareness about the role of algorithms in data use, the potential for bias, and invasion of privacy. This activity could be run online or in-person. Inspired by a 5Rights Foundation workshop.
Objectives	• Create a persona based on a low-tech database built by the participants. • Discuss the concepts of algorithmic bias, data profiling, metadata, and privacy. • Ask questions about the effects of data profiling and the potential for bias.
Big Ideas of the Week	• Algorithmic bias • Profiling through Data • Metadata • Privacy
Materials	In-person: Sticky Notes, colored markers, large sheets of paper. Online: Video Conferencing software: Zoom, WebEx, Google Meet, digital sticky notes and drawing tools in Miro, Images found online using Google Image.
Resources	ACTIVITY: Build Your Own Algorithm: https://mostlikelymachine.artefactgroup.com

"It is crazy how everything can be data, like even from the moment you were born... they might use you as a newborn to find out how you compare to other babies as an example."

—Teen, Age 14

Algorithms, Data and You

Conversation Starter

Algorithms are software programs that find patterns in our data in order to predict our preferences and behavior. Companies use these patterns to create digital profiles to tailor personalized online content for us. How accurate do you think your digital profile is?

Check it out

Watch a video about how algorithms and our personal data work together to build a profile of us and personalize our online experience. See, What even is an algorithm? (Source: The Algorithm Literacy Project).

Build a persona

At the top of a white board, write down five categories that represent parts of teens' real lives. Some categories could be, favorite food, books, music, sports, and movies (These categories are the metadata). Then, each person adds a sticky note about themselves to each category. (This is the data). This puts everyone's data together in a big group. (This is a Database). Using a sheet of paper, take one sticky note from each category and use this "data" to imagine the person it describes.

Algorithms, Data and You

Talk about it

What inferences did your group make from the sticky notes? What kind of person did you think the data describes? If the sticky note says they are interested in ballet, did you infer that they are a girl? Depending on where they live, did you infer that they are rich or poor? If they root for the Yankees or Mets, does that infer where they live (Bronx or Queens)?

Reflection

What effect might inferences made through data profiling have on the person that you described? How accurate do you think your own digital profile is? What effect might inferences made through data profiling have on you?

Activity Plan

Data Rights Dream Board

Overview	Teens will review the U.N. Convention on the Rights of the Child. Using this framework, they will explore data rights, think about about data rights for young people, and create a data rights dream board.
Objectives	• Better understand the global rights of children • Dig into the concept of personal data • Explore what digital data rights could and should exist for teens
Big Ideas of the Week	• Data Rights
Materials	In-person: Sticky Notes, colored markers, large sheets of paper, a whiteboard or wall to place sticky notes on Online: Video Conferencing software: Zoom, WebEx, Google Meet, digital sticky notes and drawing tools in Google Docs or Miro, Images found online using Google Image.
Resources	Handout: UNICEF Conventions on the Rights of the Child: https://www.unicef.org/media/56661/file

> "I think everyone has a vague idea of what can happen if their rights are breached but may not know the extent of the consequences that can occur ."
>
> —Teen, age 17

Activity Plan

Data Rights Dream Board

Conversation Starter

Human rights are agreed-upon rules, norms, and standards that various societies agree to. While there are examples of human rights and children's rights, as we navigate the digital world it is important to consider what your digital rights are and should be.

Check It Out

Review the Unicef Convention on the Rights of the Child handout (children are defined as those 18 years and younger in this context.) Teens can either review their own copy of a handout or view the handout online. As a group, quickly go over the rights that the convention outlined.

Build a Data Dreamboard

At the top of a white board, write down "Our Data Rights Dream Board." As a group, spend some time writing sticky notes about your own "dream data rights." What do you think already exists? What do you want to exist? What digital rights should all people under 18 have? After you've brainstormed, place all your sticky notes on the board.

Gallery Walk

Spend 5-10 minutes reading one another's dream data rights. Add your own sticky notes or add a checkmark to the sticky notes you agree with. Take note of when multiple teens share the same or similar ideas. Start to think about the themes you see emerging.

Uncover Themes

As a group, debrief your gallery walk. What did you see? What was interesting about your sticky notes and other sticky notes? Did you disagree with any? As a group, work together to sort the sticky notes into broad themes. Remember– these themes are flexible. Some sticky notes can go in two places, and that's okay! The themes don't need to be perfect.

Draft Your Data Rights

As a group, decide on the top three rights that emerge from your gallery walk and theme grouping discussion. Write them on sticky notes or a whiteboard.

Reflection

How does it feel to see your data rights combined in one place? Do you think there should be a digital rights convention for young people? What data rights do you think are missing in your life? How can you advocate for your data rights in your daily life? What role can libraries play?

Activity Plan

Interview with a Data Set

Overview

Teens will work in teams to use interview techniques to investigate a NYC Open Data set. Together, they will discover what information their individual data sets contain and what it means for the community.

Objectives

- Explore the purpose of civic data
- Investigate civic data
- Learn how data can be understood using qualitative interview techniques

Big Ideas of the Week

- Civic Data
- Open Data
- Qualitative Data Analysis

Materials

- In-person: Computer or laptop with internet connection
- Online: Video Conferencing software: Zoom, WebEx

Resources

- NYC Open Data Sets: https://opendata.cityofnewyork.us/
- Data Interview template (See below)

> "We can bring a lot of awareness to people, because even though this data is literally called open data, a lot of people don't know about it."
>
> —Teen, Age 16

Interview with a Data Set

Conversation Starter

Civic data is information that is recorded about a local community. Civic data can be used by governments, nonprofits, or local community members to better understand the context of a neighborhood, city, state, or country.

Explore NYC Open Data

Open the NYC Open Data web site. Explore the categories or search for data sets that interest you. [VIRTUAL: everyone can open the NYC Open Data website on their devices.]

Break Into Teams

As teams, you're going to select a data set and "interview" it (ask it questions). Which data sets stuck out to you? Which data set do you want to investigate together?

Interview Your Data Set

To brainstorm in person, use either a whiteboard, large piece of paper, or our printable template below, to outline:

- **BIOGRAPHY:** Consider the type of data, the headers on the dataset, and who collected the data. Are there any interesting facts you learned from the data? Decide on a profile picture.
- **PROFILE PICTURE:** What picture might represent this data set? It could be a real picture, a cartoon, or a drawing that one of your teammates creates.
- **QUESTIONS:** What questions would you ask this data set? What does the data set leave out? What more would you want to learn?

Interview with a Data Set

Share Out

Look at all the team data sets. Each group share what was learned in the "interview". What more would you like to learn?

Reflection

Why do you think a resource like NYC Open data exists? Is civic data is relevant to you?

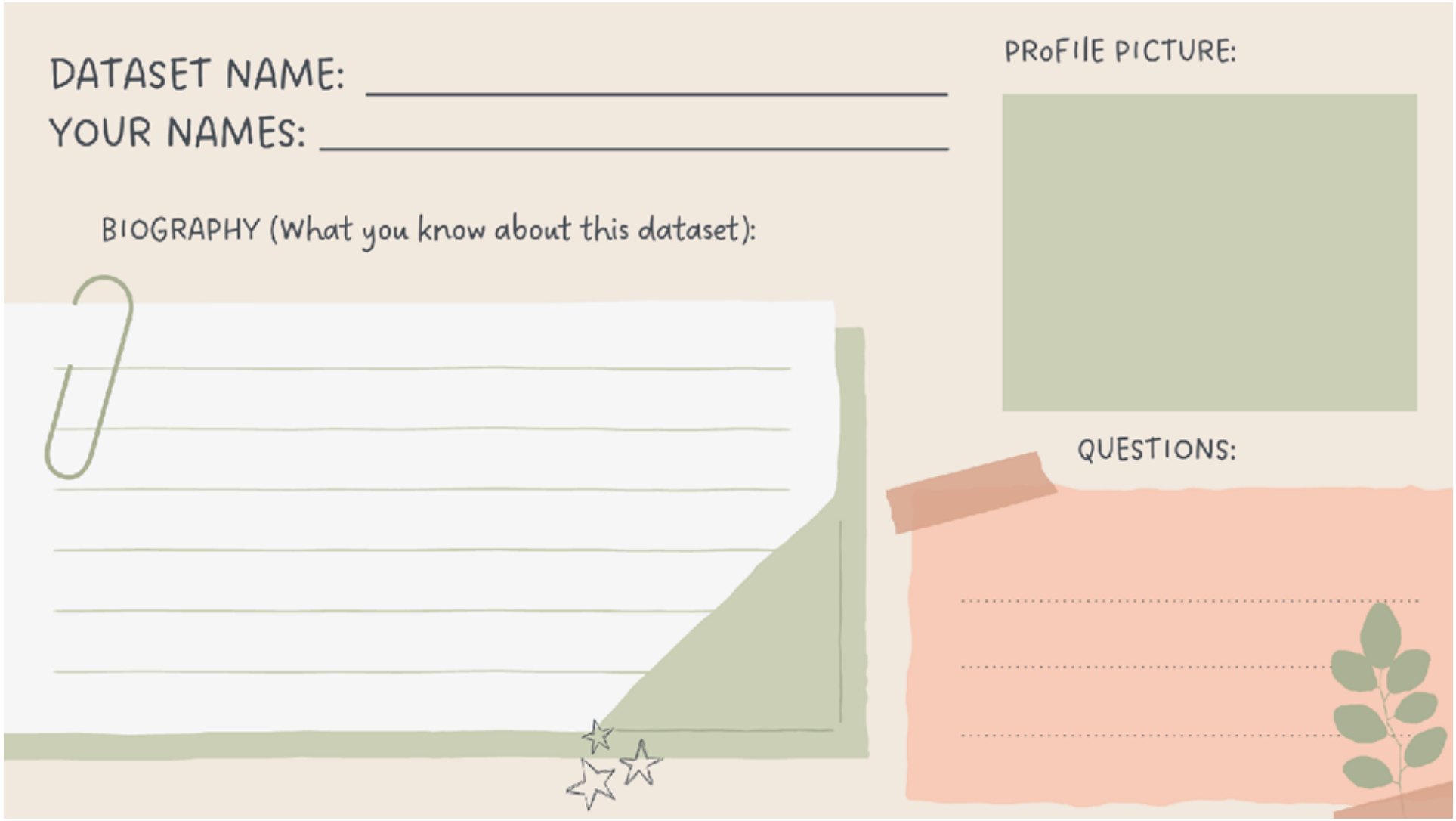
Talk About It

What did you learn about civic data by interviewing your data set? If you could go back, would you explore a different data set instead?

Tips for running this activity online: Use a Google Doc. For the data set's "profile image", teens can paste images from the web or draw images, using an online drawing tool.

Example of how teens have used the data interview template

Interview with a Data Set



Blank data interview template

Activity Plan

Data Privacy Storyboards

Overview

Teens will use a storyboard to create a narrative about personal data. Using storytelling techniques, they will explore what data privacy means to them and reflect on the ways in which data can cause or resolve their story's conflict.

Objectives

- Define data privacy.
- Form a narrative that reflects how data privacy affects and is affected by teens' lives.

Big Ideas of the Week

- Data Privacy

Materials

- In-person: Blank storyboard sheet, drawing materials
- Online: Video Conferencing software: Zoom, WebEx, Google Meet, Storyboard Template. Design tools like Miro or Canva.

Resources

- STORYBOARD TEMPLATE, on page 16

Data Privacy Storyboards

Conversation Starter

What is data privacy? Data is any kind of information about you, your community, and the world. Data privacy refers to the level of control that you have over other people's access to data about you.

Explore the Story Template

Teens can use a story template to create a cartoon, write a narrative, or just brainstorm.

For virtual groups, use a Google Doc or similar collaborative software to work together to create a story. Share this link in chat so that all teens can access.

Craft Your Story

As individuals or in a group, teens can tell their own data privacy story. If teens are working collaboratively, it's helpful to work together in a Google Doc or similar.

Talk about it

Share your stories. Talk about what elements of data privacy you chose to include and why? Consider how data privacy occurs in, influences, and is influenced by your main characters.

Reflection

How often do you consider data privacy? Have your views on data privacy changed? What actions can you take to secure your data privacy?

Data Privacy Storyboards

Storyboard Template: BUILD A STORY ARC

Individual or Group Activity

Main Characters:

Story World/Setting:

Points were there is data in the story:

Introduction:	Conflict is introduced:	Conflict gets worse:
Central conflict unfolds:	Resolution of Conflict:	Moral of the Story:

Activity Plan

Squirreling Out Civic Data

Overview

Teens will be introduced to civic data using New York City's Open Data Repository. Using the 2018 Central Park Squirrel data set, teens will dig in and explore (and draw!) squirrels based on data from the data set. Teens will navigate the data set and explore how data is organized. To wrap up, teens will discuss civic data in the context of their own lives and communities. This activity could be run online or in-person.

Objectives

- Become familiar with civic data, using the NYC Open Data repository.
- Be able to filter and search a data set.
- Build a data profile and highlight data points from the data set.
- Relate the use of open civic data to teen interests and communities.

Big Ideas of the Week

- Civic Data
- Open Data
- Making sense of data

Materials

In-person: Laptops for teens, paper, colored marker or pencils
Online: Video Conferencing software: Zoom, WebEx, Google Meet

Resources

- WEBSITE: NYC Open Data: https://opendata.cityofnewyork.us/
- WEBSITE: NYC 2018 Squirrel Census https://data.cityofnewyork.us/Environment/2018-Central-Park-Squirrel-Census-Squirrel-Data/vfnx-vebw

> "I just think that exploring a lot of data helps you scroll and see what works for you in a sense. Instead of being handed something and being told to do it, it kind of gave me that freedom."
>
> —Teen, 16

Squirreling Out Civic Data

Conversation Starter

Civic data is information that is recorded about a local community. Civic data can be used by governments, nonprofits, or local community members to better understand the context of a neighborhood, city, state, or country.

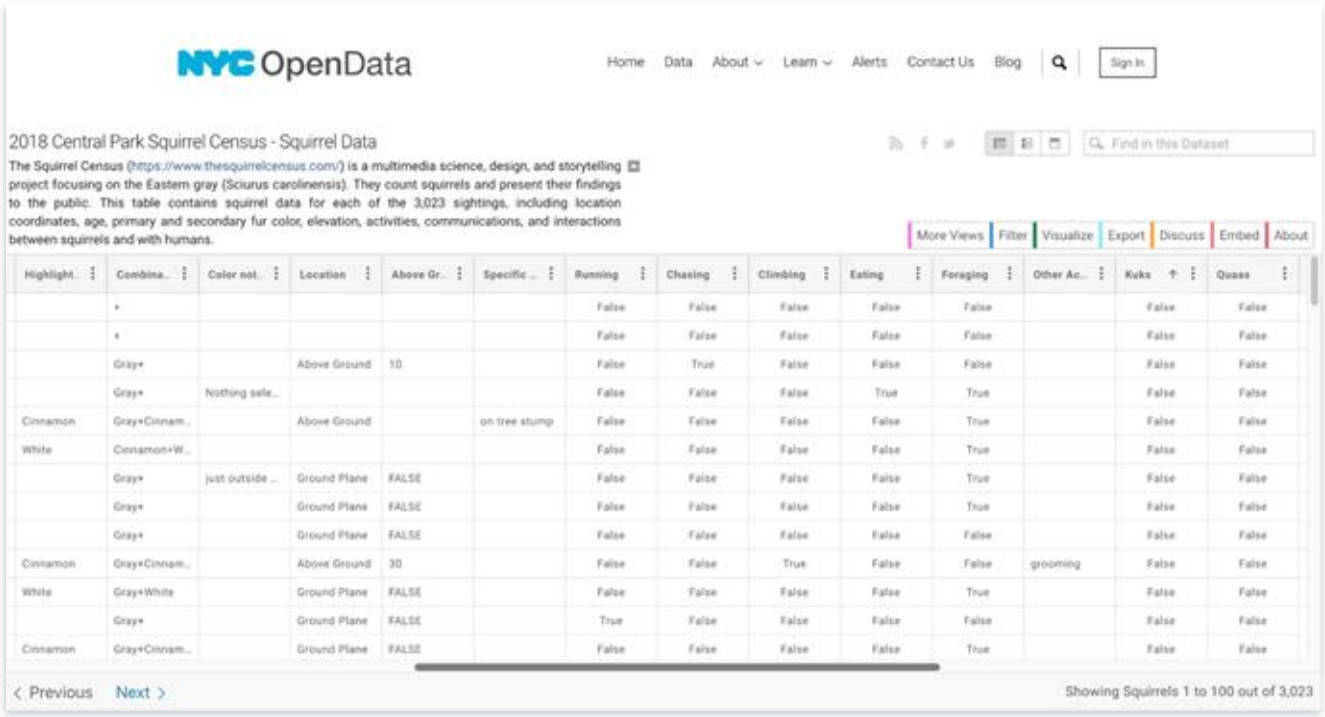


Image of the 2018 Squirrel Census

Check it out

Open the NYC Open Data website https://opendata.cityofnewyork.us/. In the search box on the NYC Open Data home page, search for "2018 Central Park Squirrel Census - Squirrel Data". Click "View Data". You should see the data set. [VIRTUAL: screenshare is perfect for this section, but teens can pull up the data set on their own devices as well] .

What types of data are available about the squirrels? Who conducted the research to populate this data set? Why might this open data be useful or interesting?

Squirreling Out Civic Data

Choose a squirrel from the data and draw it!

Open the "2018 Central Park Squirrel Census" data set. Look over the data and pick one of the squirrels. Learn everything you can from the data. Draw your squirrel as you imagine it, based on the data you have about it. Label the squirrel with its Unique Squirrel ID and a name that you come up with. [VIRTUAL: teens can use the computer to draw their squirrel or can use any materials they have around them to physically draw.]

Talk about it

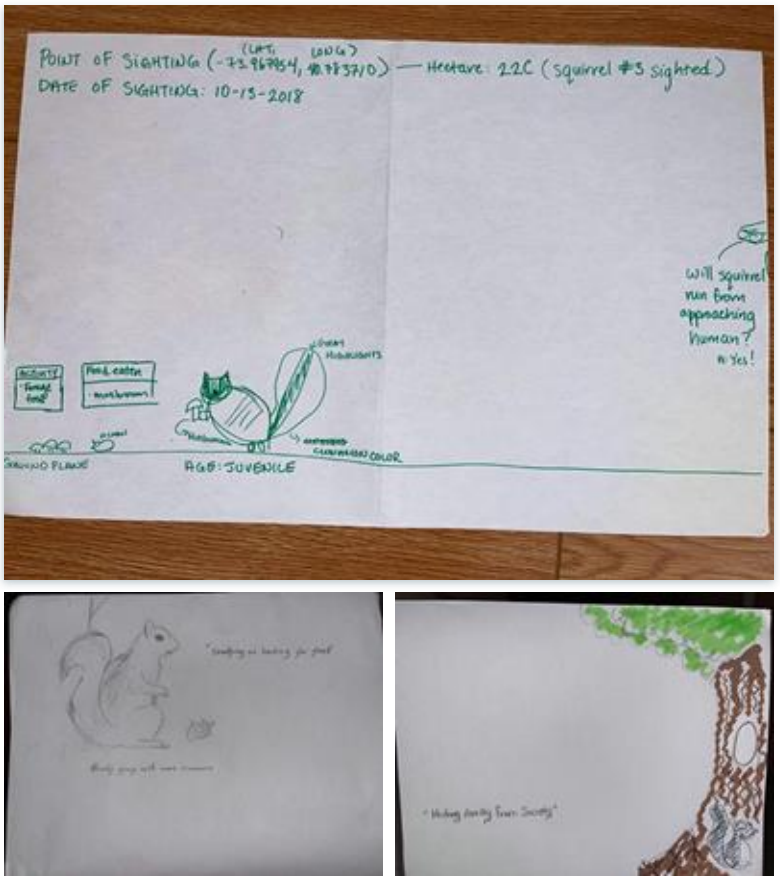
What squirrel did you draw? What choices did you make in how you drew the squirrel based on the data you had available? Did the data you used tell the whole story, or did you use your own creative interpretation skills? What more do you wish you knew about your squirrel? [VIRTUAL: Teens can send photos of their squirrels through chat. Alternatively, describe and discuss squirrels in chat.]

Reflection

What possible applications do you think open civic data could have?

What civic data about your community matters to you?

What civic data would you want to collect about your community?



Squirrel drawings based on the Central Park Squirrel Census

Activity Plan

The Words You Write

Overview

Teens will use Voyant, a web-based tool, to analyze text from a web page of their choice in order to show how social media platforms and internet marketers can analyze text. Teens will reflect on what their own internet presence may look like and how they feel about being the subjects of passive internet analysis.

Objectives

- Explore how text analysis programs make sense of internet content and behaviors.
- Discuss the concepts of data privacy, data rights, and user analysis programs.
- Ask questions about the effects of text analysis on data privacy for teens.

Big Ideas of the Week

- Text Analysis
- Data Privacy
- Personal Data
- Data Rights

Materials

- In-person: Laptops or internet-connected device(s), paper to jot notes on
- Online: Video Conferencing software: Zoom, WebEx, Google Meet, web pages to analyze, space to take notes

Resources

Website: Voyant text analysis: https://voyant-tools.org/

> "It's hard to remove content once it's been posted, things stay on the internet forever."
>
> —Teen, 15

The Words You Write

Conversation Starter

Whenever you use a website, search engine, or social media, platforms can analyze the text you write, the images you use, and the buttons you press. Today we're going to take a look at text analysis, using a tool called Voyant, to see how it analyzes the text on a website of your choice.

Check it out

First, find an interesting webpage (It's best if it has a lot of text). Copy the URL (web address). Next, open the text analysis website Voyant: https://voyant-tools.org/. Then, paste the webpage's URL (address) into the Voyant text analysis window.

Deep dive

The Voyant tool shows four different views of the text from the web page. For an example, see the image below. We used a web page about children's digital rights. The word cloud on the top left visualizes the word frequency. Other tools show where the words were used in the document and what words they were adjacent to, in order to give context the word use.

Talk about it

What are the most frequent words on the web page that you chose? Did you learn anything interesting about the webpage? Did anything surprise you? What was your favorite way to analyze text? What method do you think Voyant uses to analyze web pages? What does Voyant not capture?

Reflection

If digital platforms were to analyze the words that you leave online, what words would come up most frequently for you? What story would they tell about you?