ACCESSIBILITY IN DATA SCIENCE

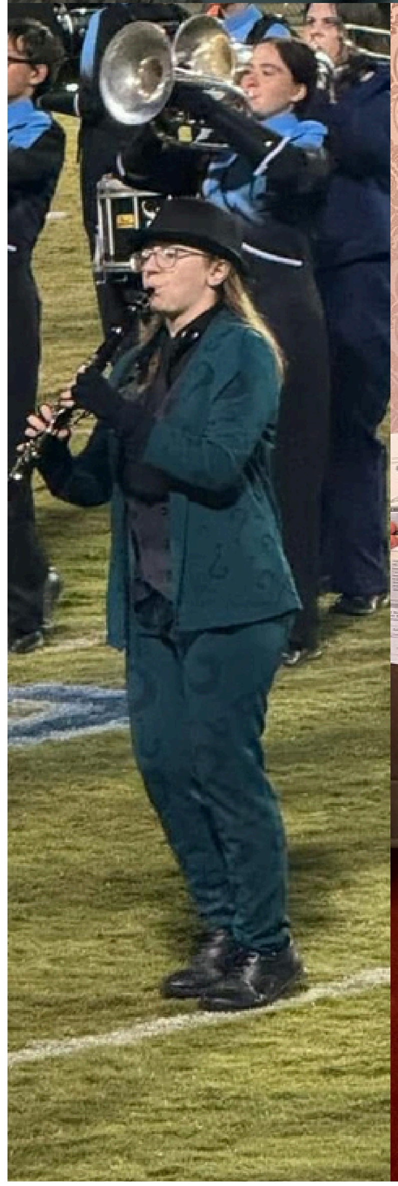
HOW DO WE REMOVE THE BARRIERS FOR THOSE WITH SENSORY LOSS? WHAT ARE THOSE BARRIERS?

PRESENTED BY : RYLEE FERGUSON

WHO AM I?

- RISING SENIOR AT PLAINVIEW HIGH SCHOOL AND SOPHOMORE AT NORTHEAST ALABAMA COMMUNITY COLLEGE
- LOVES THE SUPERHERO AND SCI-FI GENRES, BOOKS AND COMICS, ACTING, MUSIC, AND SPACE
- WILL ATTEND UAH AFTER GRADUATION, MAJORING IN PHYSICS WITH A CONCENTRATION IN ASTROPHYSICS AND ASTRONOMY

INTERNED WITH QUANTHUB IN BIRMINGHAM (REMOTELY)
MENTORED BY KELSEY BICKETT


WHY AM I FOCUSING ON THIS FOR MY PROJECT?

- I AM HARD OF HEARING AND A HEARING AID USER
- QUANTHUB’S GOAL IS TO TEACH DATA SKILLS TO AS MANY STUDENTS AS POSSIBLE
- DEAF AND/OR BLIND STUDENTS ARE IN EVERY SCHOOL DISTRICT AND MANY ARE INTERESTED IN STEM
- WE SHOULD ENCOURAGE THOSE WITH SENSORY DISABILITIES RATHER THAN BARR THEM IN THE BEGINNING

SURELY THIS IS NOT THAT BIG OF AN ISSUE. WHY FOCUS ON THIS?

THIS BARELY AFFECTS ANYONE. SUCH A SMALL PERCENT OF STUDENTS HAVE SENSORY LOSS.

HOW ARE THERE EVEN ACCESSIBILITY ISSUES OR BARRIERS IN DATA SCIENCE?

HOW MANY STUDENTS IN ALABAMA ARE BLIND AND/OR DEAF?

IM SORRY. I HAD TO ADD A STAR TREK MEME.

OK, WHAT ABOUT NATION-WIDE?

“THE APPROXIMATE NUMBER OF DEAF STUDENTS BETWEEN AGES 3-21 IS 75,000" (NCES)

“NEARLY 3% OF CHILDREN UNDER 18 YEARS HAVE BLINDNESS OR VISION IMPAIRMENT.” (CDC)

PROJECT OVERVIEW

WELL, WHAT DID I ACTUALLY DO DURING MY INTERNSHIP?

- Research. So much research
- Mastered lessons Data Security Level 1&2, Data Storytelling, Machine Learning Foundations, and Introduction to Data Literacy in Quanthub
- Utilized AI for goal setting, designing social media posts, and assistance in finding and citing sources
- Attended Sloss Tech where I learned a lot about AI and public speaking
- Participated in the FuelAL internship program where I got to see a lot of Downtown Huntsville and meet many different people working a variety of jobs
- Attended many Zoom Calls improving intern skills
- Completed smaller projects for my mentor along the way
- Learned to use Slack, Trello, and Dropbox

ISSUES AND SOLUTIONS

HEARING IMPAIRED

MANY VIDEOS REFERENCED WITHIN THE QUANTHUB PROGRAM ARE EXTERNAL SOURCES, LACKING CAPTIONS OR TRANSCRIPTIONS.

RECOMMENDATION: UTILIZE AI TO CREATE EMBEDDED TRANSCRIPTS FOR THESE VIDEOS.

SUGGESTION: TRY USING OTTER.AI OR SONIX

MANY SOURCES CITE TRANSCRIPTIONS AS THE MOST EFFECTIVE SOLUTION. THESE WILL BE ON THE “MORE READING” SLIDE.

Chapter 21 Video Set

Question 1 of 1 (1 point) | Video

Rylee

Descriptive Transcript

>> Oil is formed deep in the ground from the effects of long-term heat and pressure on ancient plant and animal remains.

The oil is either pumped to the surface or rises to the surface under its own pressure.

This crude oil is a mixture of many different hydrocarbons.

It is shipped to the refinery by tanker or pumped locally by pipe.

These hydrocarbons are separated using a process called fractional distillation.

The crude oil is heated in a furnace and fed into a large, heated tower.

The tower consists of many levels where repeated condensation and vaporization occurs as the hydrocarbons rise through the tower.

Because boiling point increases with molecular weight, lighter fractions will move further up the column while heavier fractions remain near the bottom.

The repeated condensation and vaporization increases the purity of the fractions found at each level.

These fractions are piped off to other locations around the plant for further purification and distribution.

Save For Later

Submit Assignment

PHOTO FROM MCGRAW HILL'S ALEKS CHEMISTRY COURSE

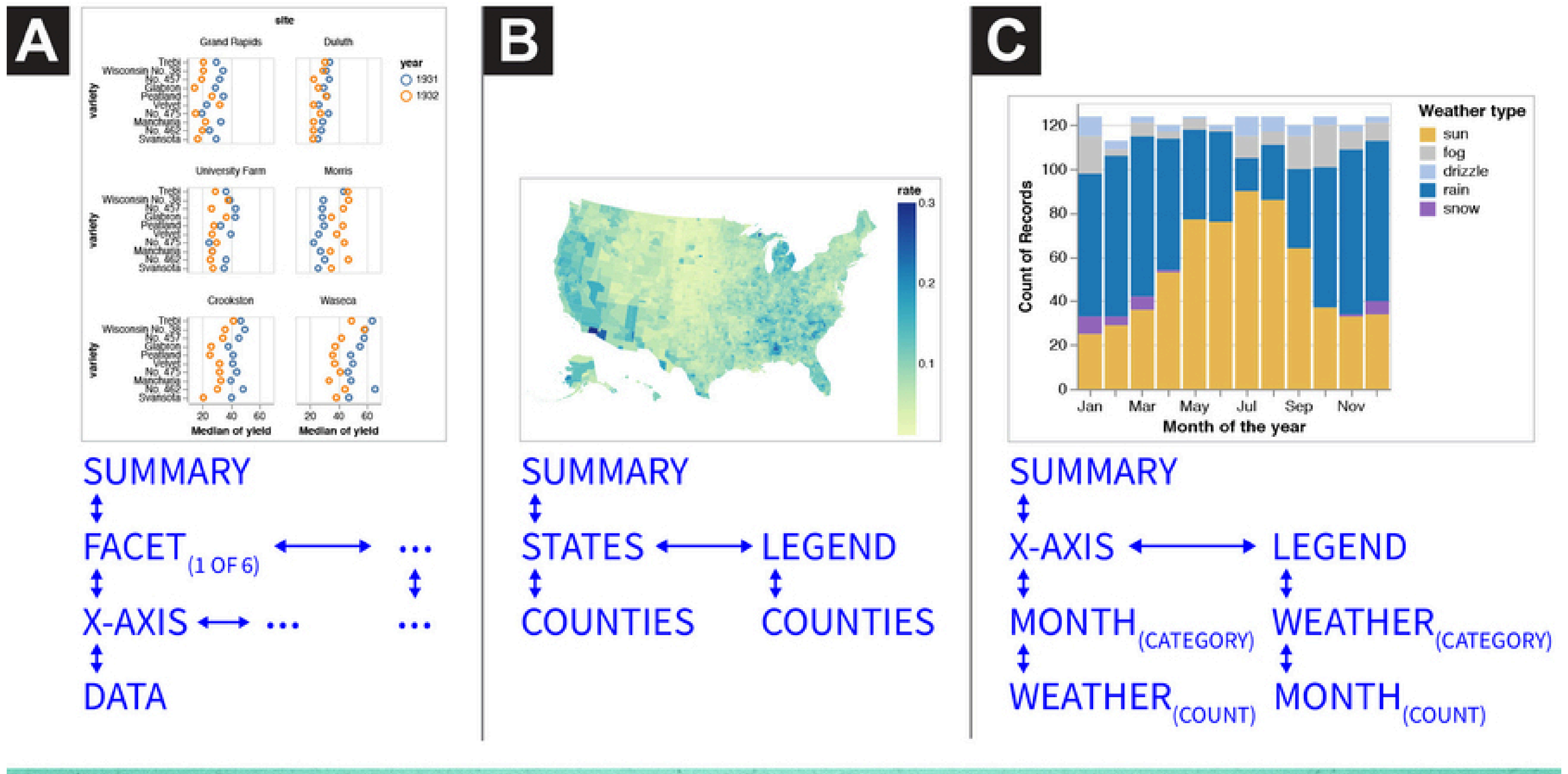
VISUALLY IMPAIRED

DATA VISUALIZATIONS

HOW DO WE MAKE A FORM OF DATA STORYTELLING RELIANT ON SIGHT ACCESSIBLE TO THOSE WITHOUT SIGHT?

- LABEL ALL AXIS AND CONSISTENTLY USE TITLES, HEADERS, ETC.
- LEGENDS SHOULD BE ABLE TO BE READ BY A SCREEN READER
- AVOID RELIANCE ON SIMILAR COLORS TO DIFFERENTIATE DATA

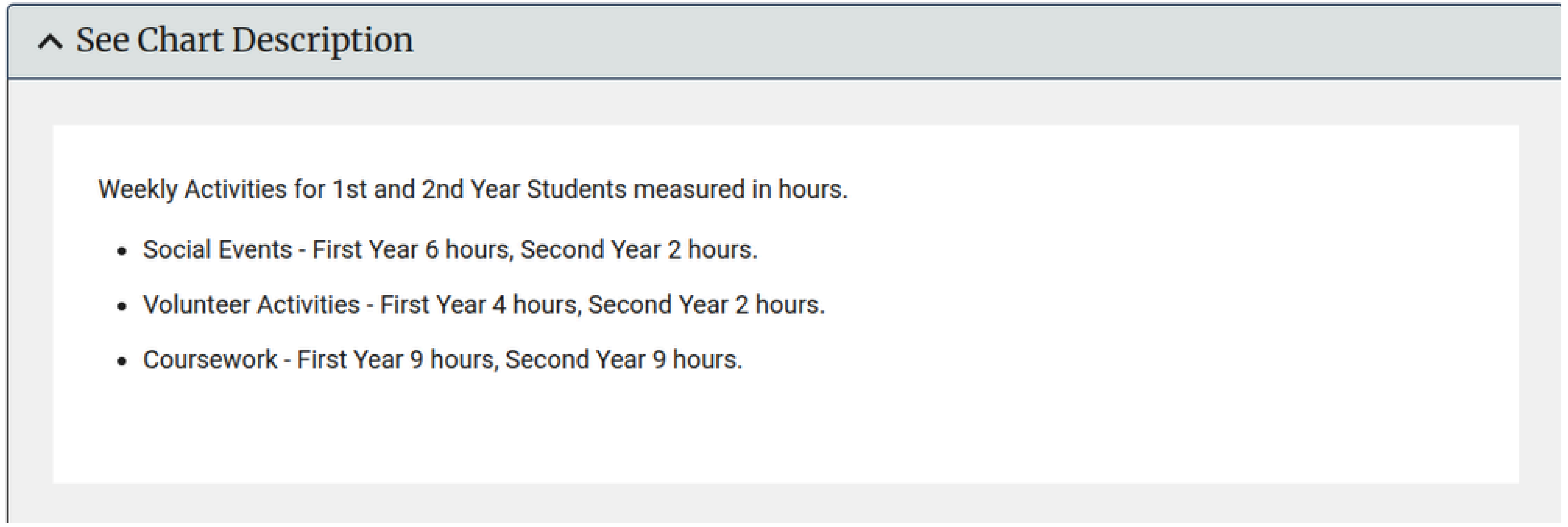
PHOTO DEMONSTRATES HOW DESCRIPTIONS SHOULD RUN FOR DIFFERENT GRAPH TYPES



(PHOTO SOURCE:MIT)

WHAT DIFFERENT WAYS CAN A DATA VISUALIZATION BE ACCESSIBLE?

STANDARD:


See Chart Description

Weekly Activities for 1st and 2nd Year Students measured in hours.

- Social Events - First Year 6 hours, Second Year 2 hours.
- Volunteer Activities - First Year 4 hours, Second Year 2 hours.
- Coursework - First Year 9 hours, Second Year 9 hours.

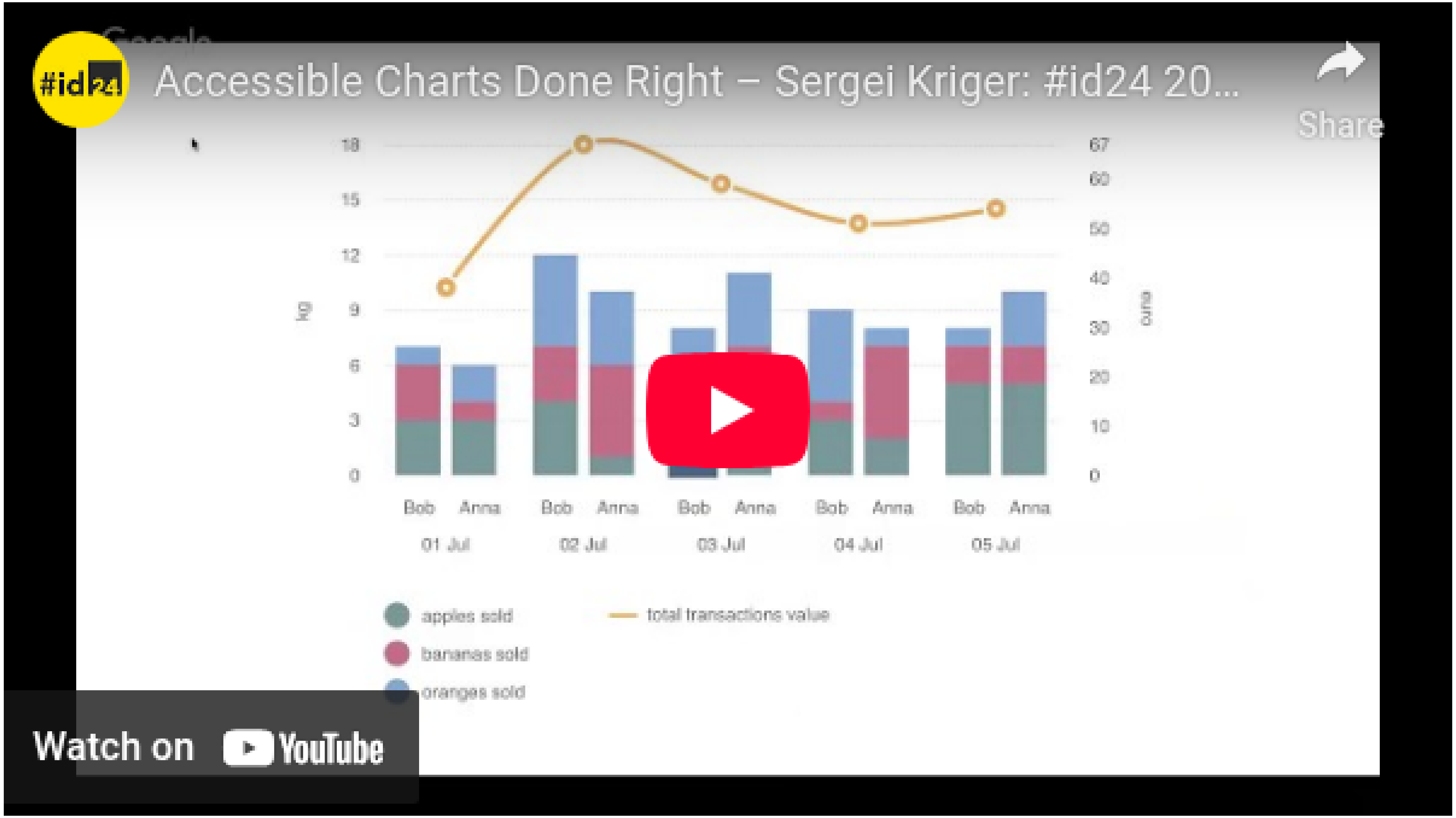
PHOTO FROM A HARVARD BLOG

- INTERACTIVE WITH A KEYBOARD
- ALT TEXT WITHIN THE VISUALIZATION

EXPERIMENTAL:

- SONIFICATION
- REFRESHABLE TACTILE DISPLAYS (RTDS)

(IMAGE SOURCE)



VIDEO OF HOW AN ACCESSIBLE GRAPH IS READ BY A SCREEN READER

HOW DO WE BEGIN TO MAKE EDUCATIONAL SITES BECOME MORE ACCESSIBLE?

START SMALL.

- ADD CAPTIONS TO A VIDEO
- ADD ALT TEXT TO A PHOTO
- MAKE ALL TEXT BIGGER THAN 12 PT
- READ THROUGH THE WCAG

YOU'RE A PHYSICS MAJOR. WHY BOTHER WITH THIS?

- I LEARNED MANY DATA SKILLS THROUGH QUANTHUB
- I CONDUCTED A LOT OF RESEARCH ON MY OWN
- I LEARNED HOW RESEARCH AND EDUCATION GRANTS WORK
- I DID A LOT OF NETWORKING AND MET LOTS OF IMPORTANT PEOPLE
- I LEARNED TO WORK REMOTELY AND KEEP MYSELF ACCOUNTABLE

ALL OF THESE WILL HELP ME WITH MY NEXT BIG STEP: A NASA INTERNSHIP

QUESTIONS?

THANK YOU!

MORE READING

THIS IS ALSO EVERY SOURCE FROM WHICH I GOT MY DATA

HEARING IMPAIRED:

HEARING IMPAIRED SOURCES

VISUALLY IMPAIRED:

VISUALLY IMPAIRED SOURCES