DESCRIPTION

As an introduction to the Water Conservation Data Jam, students participate in an interactive data jam with their classmates using a dataset on social media. Once they have been introduced to all the project components, they learn how to start exploring the water dataset they will use for their own projects.

GRADE LEVEL
6-12

OBJECTIVES

Students will:

- Understand the components of a data jam
- Practice finding a data trend and developing a creative project using a sample dataset
- Apply their understanding to the water use dataset

TIME
45 MINUTES

MATERIALS

- Optional: Making Your Own Dataset
- Internet-connected device [1 per student or 1 per class with a projector]
- Introduction to the Water Conservation Data Jam video
- PowerPoint presentation
- Class Poem Document [fillable PDF]
- Social Media Dataset
- Water Use Dataset
- Social Media Sample Project
- Rubric

PREPARATION

1. Optional: prepare your own Water Use Dataset for a county near you instead of using the datasets available from Asombro. Follow the instructions in Making Your Own Dataset.
2. Set up a computer with internet access and a projector (if applicable) and prepare to show the PowerPoint.
3. Prepare to use the Class Poem Document and PowerPoint to guide students through creating a class poem together as an example data jam project. You can choose to either add the sentences students will write to the Class Poem Document during class or collect students' sentences, add them to the document later, and show it to the class during the next lesson.
4. Have students watch the three-minute Introduction to the Water Conservation Data Jam video. You can either assign this as homework before the lesson or watch the video together in class. The transcript is available here.
5. If needed, set up an assignment in your online learning platform (Canvas, Google Classroom, etc.). Here is some suggested text for the online assignment:
   If you did not watch the Introduction to the Water Conservation Data Jam video, you can find it here: https://www.youtube.com watch?v=Ax3lRXAbN0g. Before the next class, go to the Water Use Dataset webpage. On this webpage, click the button for your county. Then:
   1. Read the Background and Procedures boxes for the dataset.
   2. Watch the short video about the dataset.
   3. Choose a water-use category that you are interested in investigating.
   4. Look at the other resources available on this website.

PROCEDURES
Introduction

1. **Slide 1**: New Mexico is a dry state, and it is essential to find ways to conserve our limited water resources. You will think about this as you complete your Water Conservation Data Jam project. You will learn how to interpret a set of data, find a creative way to represent a data trend, and develop an action plan to address water conservation issues. Today, we will learn about the different parts of a data jam by doing an example data jam together before you start on your own projects.
2. **Slide 2**: data are important, and they can tell us what is going on in the world. You have probably seen something like this graph of COVID-19 cases in New Mexico.
3. **Slide 3**: data can also be fun and tell you about individuals. This graph shows my desire for ice cream throughout the day, and we can see a pattern. My desire for ice cream is low in the morning, and it increases throughout the day. Educators can change the title and y-axis of this graph to make it about something more applicable to themselves.
4. **Slide 4**: now it is your turn to create a graph that shows a data trend about you. This graph has the time of day on the x-axis, and the y-axis is unlabeled. You will pick the label for the y-axis of this graph that best describes you. The graph shows that your choice for the y-axis label needs to be something that increases steadily throughout the day.
   a. Your choices are: A. My desire for Takis; B. Loudness of my voice; C. Strangeness of filters I use for a selfie; or D. My fear of being attacked by zombies. Educators may edit these options to fit their class or allow students to make up their own label. Ask students to share their choices, and make a note of which choice was the most popular.
   b. Explain that [A, B, C, or D] was the most popular answer, which

means that, for example: "In this class, students' desire for Takis increases steadily throughout the day." This one-sentence explanation of a pattern in data is called a **data trend**.
   c. We used fabricated data for this example, but in the Water Conservation Data Jam, you will use actual data collected by scientists.

Overview of Introduction Video Content

1. **Slide 5**: the Water Conservation Data Jam has two goals. One goal is finding a creative way to represent a data trend so that a non-scientist can understand it. You will do this by writing a short report with seven sections and making a creative project.
2. **Slide 6**: this is an example from a dataset that you will not use about kangaroo rat populations.
   a. This student was given a dataset from a study on kangaroo rat populations from 1995 – 2007. Data were collected during the Small Mammal Exclusion Study at the Jornada Basin LTER (Long-Term Ecological Research) site near Las Cruces, NM.
   b. The student examined the dataset and noticed a data trend or pattern in the data. They wrote the data trend in a complete sentence: "While the kangaroo rat population size was relatively constant over time, it was much higher in 1998 and 2000."
   c. Then, the student came up with a creative way to show that data trend: piñatas shaped like kangaroo rats. The circumference of each piñata is scaled to the number of kangaroo rats caught by scientists. The scale is one centimeter of circumference represents one kangaroo rat. You can see the data trend by looking at the piñatas. The piñatas are bigger in 1998 and 2000 and smaller in the other

years.
3. **Slide 7**: after identifying a data trend and representing it creatively, the second goal is to propose an action plan to address the water conservation issue you identified in your data trend.
4. **Slide 8:** your action plan will present a solution to the water conservation issue you identified in your data trend. This is a student sample of an action plan from a previous class. They identified a data trend about water use by livestock and presented an action plan to store water for animals.

Example Data Jam with a Social Media Dataset: Finding a Data Trend

1. **Slide 9**: to complete the Water Conservation Data Jam, you will:
   a. Identify a data trend from a water dataset.
   b. Make a creative project.
   c. Design an action plan.
   d. Complete your written report. Today, we are going to do an example data jam project together as a class to learn about all the parts that you will include in your own data jam project.
2. **Slide 10**: the first thing we do in a data jam is look for **data trends**. A data trend is a story told by the dataset, a pattern in the data, or a relationship between two or more variables. It should be one to two sentences. At the beginning of class, we identified a data trend using the graphs of made-up data. (Remind students of the data trend from your class.) The student project shown earlier included the data trend: "While the kangaroo rat population size was relatively constant over time, it was much higher in 1998 and 2000."
3. **Slide 11**: we will start our example data jam by looking at a sample dataset and finding a data trend. We will use the Common Online Data Analysis Platform (CODAP) tool to explore the datasets.
4. Switch from the PowerPoint to

the social media dataset on the Asombro website (asombro.org/social).

5. For your Water Conservation Data Jam project, you will use a dataset about water. Today, we will do an example data jam using a dataset about social media. This dataset is set up the same way as the dataset you will be using for your own project, so everything we do today will help you with your own project.

6. Explain each section of the dataset webpage.

   a. At the top of the dataset page is the **background section** (Figure 1), which provides general information about the topic. For example, this background section explains that social media has been around less than 30 years but is used by hundreds of millions of people globally and is important to the economy.

   b. The **procedures section** (Figure 2) explains how the data were collected. Remember that you do not collect your own data for the Water Conservation Data

Jam. Instead, you are using an existing dataset. It is still important to understand who collected the data and how they were collected. These data come from a research group that did a survey in 2018 asking people which social media platforms they used.

   c. Scroll down to see the **data**.

   d. We are using a tool called CODAP, the Common Online Data Analysis Platform, created by the Concord Consortium. This tool helps us explore and graph the data to find a data trend.

   i. Note that data are shown to us in a table and a graph. What kind of graph do you see? [Answer: scatterplot]

   ii. When we are looking for a data trend, the first thing we do is figure out which variables are included in the dataset. Variables are things that are measured – or things we have data on. They can be found in the title and column headings of tables and the titles,

axis labels, and legends of graphs. What variables do you see in this dataset? [Answer: age group, social media platforms (YouTube, Facebook, Instagram, Snapchat), percentage of people who use each platform, technology owned (smartphone, laptop or desktop computer), and percentage of people that use each technology.]

7. Guide students to identify data trends.

   a. There are a lot of data on this webpage, so to find a data trend, you should start by focusing on one or two variables by taking other variables off the graph. To remove a variable, click on the variable on the y-axis, then "Remove Y: variable." For example, click "Snapchat" on the y-axis, then "Remove Y: Snapchat" (Figure 3).

   b. Take **YouTube, Facebook, and Snapchat off the graph**. With just Instagram on the graph, what data trend do you see?
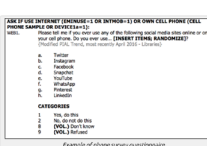

Figure 1. Background section of dataset
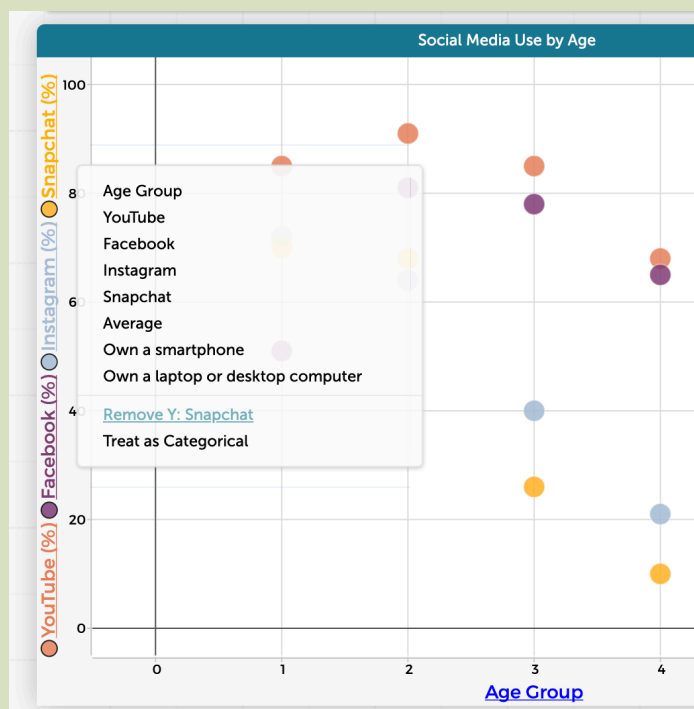

Figure 2. Procedures section of dataset

Figure 3. Removing a variable

[Answer: The percentage of people who use Instagram decreases with age.] This is a good example of a data trend.

c. We just looked at two variables (age group and percentage of people who use Instagram). You might want to compare more variables.

d. <u>To add another variable to the graph, drag it to the y-axis</u>. You will see a plus sign at the top and "add attribute: [variable]" (Figure 4). **Add YouTube to the graph**. If you compare YouTube and Instagram, you see that "more people use YouTube than Instagram in every age group." That is another good data trend.

e. **Remove YouTube, then add Snapchat back to the graph**. The data trend here is, "the percentage of people using Snapchat and Instagram decreases with age."

f. A good data trend needs to include the main variable in the dataset. In this example dataset, we need to include the percentage of people who use social media. Additional variables are given (e.g., percentage of people who own a smartphone), and we can use them to explain our data trend.

8. Switch from the dataset website back to the PowerPoint.

9. **Slide 12**: in the next lesson, we will learn more tips and tricks for using CODAP. You will use this tool to look for data trends in a different dataset for your own projects.

10. **Slide 13**: there are five qualities of a good data trend. A data trend will:

a. Show a pattern, not just one data point.

b. Have more than one variable.

c. Only use data found on the dataset. In a data jam, you will not collect your own data or find data from other sources.

d. Be specific.

e. Include the main variable. In the social media example, the main variable was the percentage of people who use social media.

11. **Slide 14**: keeping the criteria on the previous slide in mind, which of these data trends is a good data trend for our example data jam project? Option 1 is "Teenagers who use Facebook don't have any friends." Option 2 is "85% of teenagers use YouTube." Option 3 is "The percentage of people who use Snapchat and Instagram decreases with age." Have students vote by holding up one, two, or three fingers. If teaching remotely, you can use a poll or chat.

a. Option 3 is the best data trend because it meets all of the criteria of a good data trend.

b. Option 1 does not work because our dataset did not include any information about how many friends people have.

c. Option 2 does not work because it is a data POINT, not a data TREND. This statement can be graphically represented using only one number from the data table, and a data trend needs to include multiple data points.

12. **Slide 15**: this data trend shows a pattern in the data.

a. It has more than one variable (percentage of people who use Instagram, percentage of people who use Snapchat, and age group).

b. It only uses data from the dataset we were given.

c. It is specific and explains the variables we used. "Younger people use Instagram and Snapchat less" is an example of a data trend that is not specific enough.

d. It includes the main variable in the dataset: the percentage of people who use social media.

e. Once you have identified a data trend and written it in a single sentence, you will need a graph that shows that data trend; we will use this one we made in CODAP.
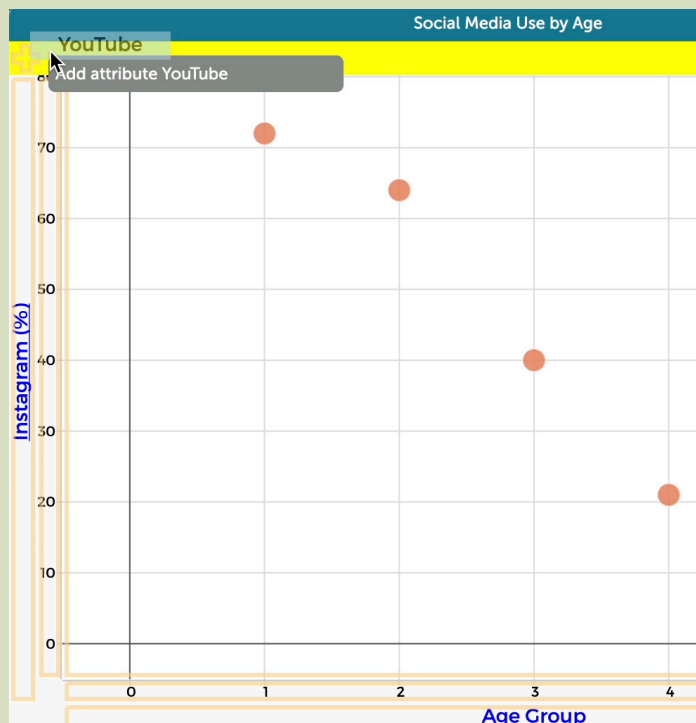

Figure 4. Adding an attribute (variable)

Example Data Jam with a Social Media Dataset: Possible Explanation and Creative Representation

1. **Slide 16**: you will also come up with a possible explanation that explains your data trend. Do not include this explanation in your data trend – it has its own section. In this section, you should try to explain why the data trend you identified is true. Think about what the pattern could mean. This is where you can look for additional information outside the dataset.

2. **Slide 17**: once you have identified a data trend, you will develop a creative way to show that trend. A creative project represents your data trend in a new and unusual way, like the student who made piñatas to show kangaroo rat population data. You should look at a creative project and see the data trend; we can see from the large piñatas which years had higher kangaroo rat populations. You can use symbols, objects, actions, or words to represent the data. Videos, pictures, words (like a poem or song), models, and food are just a few examples of ways you can represent a data trend.

3. **Slide 18**: these projects are examples made to represent the data trend: "the percentage of people who use Snapchat and Instagram decreases with age." The slide shows a picture of a model made with beads, an infographic with social media logos, and a screenshot from a video of a student bouncing a basketball to represent the data.

4. **Slide 19**: another example of a creative project is a poem. As a class, we are going to make a poem that shows our example data trend.
   a. Our data trend only talks about Snapchat and Instagram, so we do not need to include other social media platforms.
   b. We want the number of words in each sentence of the poem to represent the percentage of people in each age group that use that social media.

   i. We could make each word represent 1% of people, but that would mean, for example, we would need a 72-word sentence to represent Instagram use by 13-17-year-olds.
   ii. Instead, we decided to make one word represent 3% of people in the age group who use the social media platform. To figure out the number of words in each sentence, each number from the data table was divided by 3 (and rounded to the nearest whole number).

   c. Each student will write one sentence of the poem. The first two sentences are filled out already as examples. For example, the first sentence represents the percentage of 13-17-year-olds who use Snapchat and has 23 words: "#Snapchatslaps! It's lit and not for Boomers, the filters update and keep it fresh, which piques my interest and makes it the best!"
   d. The second sentence represents the percentage of 13-17-year-olds who use Instagram and has 24 words: "Lots of teens use social media, Instagram is pretty popular, I don't know why people like it, I have never used it even once."

   i. This example shows that even if you do not use the social media platform you are assigned to write about, you can still write a sentence about it.

   e. Each student is assigned one age group and social media platform combination based on the first letter of your first name. These assignments are listed on the slide. For example, if your name starts with A, you will write a sentence with 23 words about how 18-29-year-olds use Snapchat.
   f. Tell students to write their sentences with the correct number of words and label the app name and corresponding age group. Compile student responses into one poem using the Class Poem Document, and share it during the next lesson.

Wrap-Up

1. **Slide 20**: today, we did an example data jam using a dataset about social media. In the next class, you will be using the same steps and tools we used today to start your own data jam project to explore water use data. Here are the steps:
   a. Choose one or more water use categories. You can find the dataset at asombro.org/WCDJData.
   b. Use CODAP to find a data trend.
   c. Make a creative project that shows that data trend.
   d. Make an action plan based on that trend.
   e. Compile a report in a slide presentation that includes title, data trends, graph, possible explanation, creative project, action plan, and brief reflection.

2. **Slide 21**: finding a data trend is the first step in Water Conservation Data Jam, and it is crucial in moving forward with the project. Your creative project and action plan both need to be based on your data trend.

3. **Slide 22**: in the next lesson, we will learn more about finding a data trend. Explain the homework assignment to students.
   a. Before the next class, students should explore the water dataset at http://asombro.org/WCDJData/. If time allows, show the dataset webpage to students.
   b. Students should read the background and procedures section, watch the dataset video, choose a water-use category they are interested in investigating, and look at the other resources available on the website.
   c. Note that there are many other buttons on the page (Figure 5);
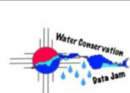
these are resources to help students.

i. Introduction Video: this is the video provided to students as an assignment or viewed as a class before this lesson. This video can be viewed by students at any time as a reminder of the project. The transcript for this video is available here.

ii. About the CODAP Dataset Video: this video helps students navigate the Water Conservation Data Jam dataset using CODAP. The button toward the bottom of the page, above the data, links to this same video. The transcript for this video is available here.

iii. Social Media Sample Project: this shows a completed report using the example social media dataset used in this lesson.

iv. Rubric: this is the grading rubric for the Water Conservation Data Jam. This rubric is available for students to view at any time so that they are aware of each component of the final report and the point value for each component.

v. Creative Project How To Video: this video is a review of the lesson, Creative Projects and Action Plans. It will help students make a creative project based on their data trend. The transcript for this video is available here.

Figure 5. Buttons on the dataset webpage link to additional resources that may help students with their projects.