Welcome to DataBytes!

DataBytes, short for "Data Story Bytes," are quick (30 minutes or less) discussion activities to critically analyze and interpret data visualizations in ways that connect to students' lives and to important issues in society. DataBytes include data visualizations about scientific and everyday issues from common news sources. Teachers can select from a series of questions to guide students through:

Making sense of trends and relationships in the data or visualization, what these patterns mean, and how they connect to key science concepts.

Building personal connections by considering how students' own lives and communities may be impacted by or reflected by the patterns found in data.

Reflecting on the context and history of the data, how it was collected, by whom (including what gets "counted" and why), how it is visualized, what might be missing/hidden, and what questions the data can and cannot answer.

Envisioning future uses of data and visualization to expand the investigation, include and explore different perspectives, and highlight the importance of understanding what's happening in the world around us in multiple ways.

Our student-facing materials (formatted as slide decks, see here or see the links in the teacher guides below) are **fully bilingual** (English/Spanish). This document also comes with a toolkit for building your own DataBytes activities, a student glossary of key terms in English and Spanish, and teaching ideas for supporting multilingual students.

How to Use DataBytes

1. Visit the [Table of Contents](#) to find a DataByte that works for your classroom. As we develop this resource, you will be able to search for DataBytes by NGSS Core Concept, Graph Type (e.g., scatterplot, histogram), or Everyday Issue (e.g., climate change). For now, there are only a few visualizations related to climate and habitat.

2. Decide how you want to use the DataByte. For example, you can project a DataByte graph to lead a whole classroom discussion, distribute it for group work, or have students take it home as a worksheet to discuss with their families or to work on independently.

3. Each DataByte is designed to work with the same set of questions for students to consider as they review the graph. These questions were developed to highlight the path from making sense, considering personal connections, reflecting on the context and history of data, and envisioning future uses of data that are highlighted in the colored blocks above.

4. For the [Ready-to-Use DataBytes](#) featured in this document, we provide a slide show that presents each visualization and series of questions in an easy-to-digest format, as well as a teacher guide that includes recommendations for specific prompts and discussion points. Some DataBytes also include interactive CODAP documents so you and students can explore the data more in-depth. For more info on **what CODAP is and how to use it**, check out [this online guide](#), or download this [PDF intro](#).

5. If you enjoy the DataBytes technique, try your hand at creating your own. Our [DataBytes Toolkit](#) points to places where you can find more data visualizations that match your students' curriculum, community, and interests. Adapt and adjust our [generic DataBytes questions](#) to get your students thinking, and see suggestions to support students with challenging vocabulary.

6. All DataBytes materials are view-only access. If you would like editable versions, you can download this document or any slidedeck as a .zip file by right clicking on the file in [Google Drive](#), and then selecting "Download". You can then edit the materials using common office software such as Powerpoint, Keynote, Word, and Pages, or upload the .zip file to your own Google Drive location to edit as Google Documents. Please check out our [licensing terms and conditions](#) for more information.

Table of Contents

Ready-To-Use DataBytes

On the following pages, you'll find the teacher guides for a number of DataBytes that you can simply print or project for your class. These are preselected to match common middle school science content, and come with additional prompts to help foster a productive discussion in a short period of time.

Exploring Carbon Dioxide and Costs for Vehicles
Climate Threats
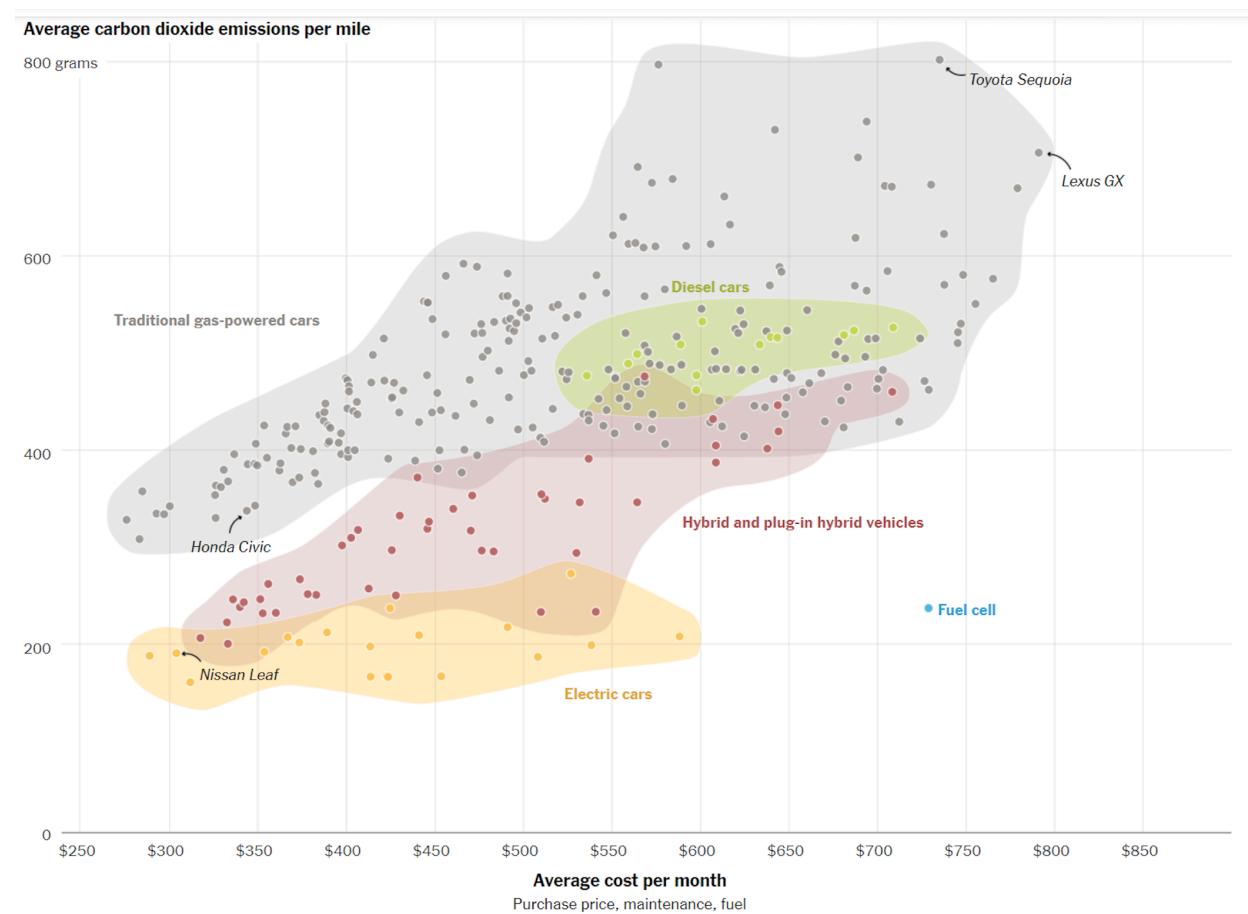Rising Global Temperature
Changes in Fish Habitat

Exploring Carbon Dioxide and Costs for Vehicles

DataByte Student Slide Deck

News Story | *NGSS Standard: MS - ESS3 Earth & Human Activity*

Average carbon dioxide emissions per mile

Toyota Sequoia
Lexus GX
Diesel cars
Traditional gas-powered cars
Hybrid and plug-in hybrid vehicles
Honda Civic
• **Fuel cell**
Nissan Leaf
Electric cars

Average cost per month
Purchase price, maintenance, fuel

Caption. This graph shows the average amount of carbon dioxide released from a vehicle per mile. It also shows the average cost per month for each type of vehicle.

Making Sense

1. What is the first thing you think about or wonder when you see this graph?
   Potential teacher prompts: What do the four colored regions mean? What does each dot represent or stand for? What does the position of dots mean?

2. What do you notice in the graph?
   Potential teacher prompts: Describe some of the patterns you see. Why are the dots more spread out in the upper right-hand corner of the graph? Why are certain dots labeled while others are not? What does this graph tell you about whether some kinds of cars are better for the environment than others?

Personal Connections

3. Do you have a personal connection with the data or patterns in this graph? Why or why not? Which people or groups do you think would feel more or less of a connection with the data or patterns here?

Potential teacher prompts: What does this visualization say about people who don't have cars and might use the bus or a bike instead? Did you find yourself looking for where your family's car might be on the graph? Not everyone is able to choose what car they drive, does that affect how you think about this graph?

4. Does this graph help you understand how cars and carbon dioxide affect you? What other information would you want or need to better understand how carbon dioxide affects you?

   Potential teacher prompts: Does this graph help us understand why carbon dioxide is bad for the environment? What do we know about what more carbon dioxide in the atmosphere means for our school and neighborhood?

Context and History

5. Who do you think made this graph? Why did they collect this information and create this graph? What did they want to know?

   Potential teacher prompts: Why are certain car types (e.g. hybrid, traditional, diesel, or electric) highlighted, like the Lexus GX or the Honda Civic?

6. What could you do to this dataset/graph to make it more useful for yourself or others who might not be included here? For example, would you collect more data, group or graph the data differently, take different measurements, or focus on certain parts of the data?

   Potential teacher prompts: How could you include people who don't use cars but do use other modes of transportation like a bicycle, bus, or BART? What would you need to know to imagine where a specific car would be located on this graph?

7. What are some reasons for the patterns you see? How might these patterns be different if the data had been collected by different people, or in a different time period?

   Potential teacher prompts: What would this graph look like if it did include other transportation options like taking the BART, biking, or walking? What would it look like if it focused on the average transportation costs and carbon emissions of different countries, instead of different cars? What might it look like in 1980 before electric cars were invented?

Future Uses of Data

8. What are some questions you can use this data or graph to answer? What are some questions this data or graph cannot help answer?

9. If you had to write an article about cars and carbon dioxide based on this graph, what would the headline be? What might be missing from that article?

10. What else does this activity make you want to know about?

Climate Threats

| *NGSS Standard: MS-ESS3 Earth & Human Activity*
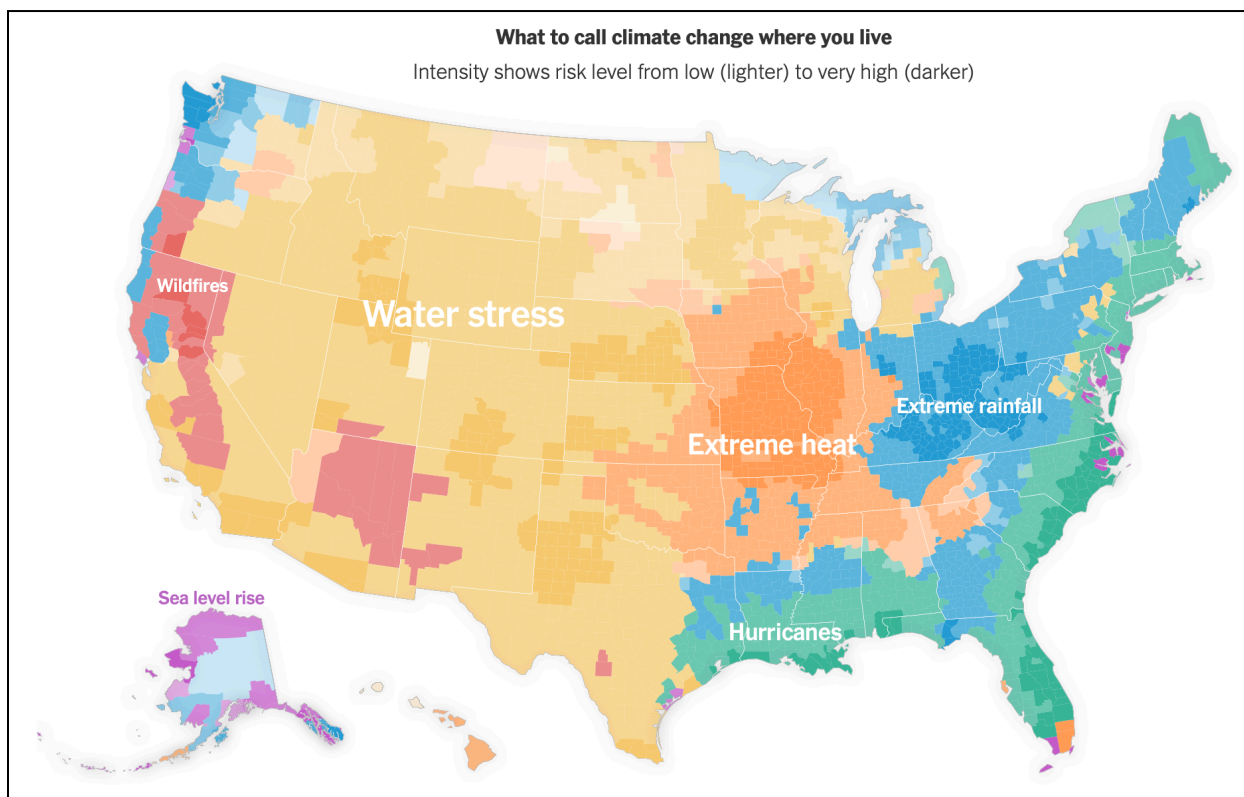
Caption. The map shows different climate threats across regions of the United States. Each color represents a different threat, labeled on the map.

Making Sense

1. What is the first thing you think about or wonder when you see this graph?
2. What do you notice in the graph?
   > *Potential teacher prompts: Are there any locations that are not susceptible to a climate threat?*

Personal Connections

3. Do you have a personal connection with the data or patterns in this graph? Why or why not? Which people or groups do you think would feel more or less of a connection with the data or patterns here?
   > *Potential teacher prompts: Which climate threats occur in areas familiar to you?*
4. Does this graph help you understand how climate affects you? What other information would you want or need to better understand how climate affects you?
   > *Potential teacher prompts: Do you wonder about how frequent these different threats occur? What makes a location high risk vs. low risk?*
5. Who do you think made this graph? Why did they collect this information and create

this graph? What did they want to know?

> *Potential teacher prompts: Who would find this data useful? Insurance companies?*

Context and History

6. What could you do to this dataset/graph to make it more useful for yourself or others who might not be included here? For example, would you collect more data, group or graph the data differently, take different measurements, or focus on certain parts of the data?

> *Potential teacher prompts: How do climate threats in California differ from those in other states?*

7. What are some reasons for the patterns you see? How might these patterns be different if the data had been collected by different people, or in a different time period?

> *Potential teacher prompts: Would this information be useful to migrants or settlers?*

Future Uses of Data

8. What are some questions you can use this data or graph to answer? What are some questions this data or graph cannot help answer?

> *Potential teacher prompts: What types of resources would be useful in different areas on the map to combat climate threats? How does the area of a threat relate to population density? How have these threats changed over time?*

9. If you had to write an article about climate threats based on this graph, what would the headline be? What might be missing from that article?

> *Potential teacher prompts: Have you experienced any of these climate threats? Where were you? What was it like?*
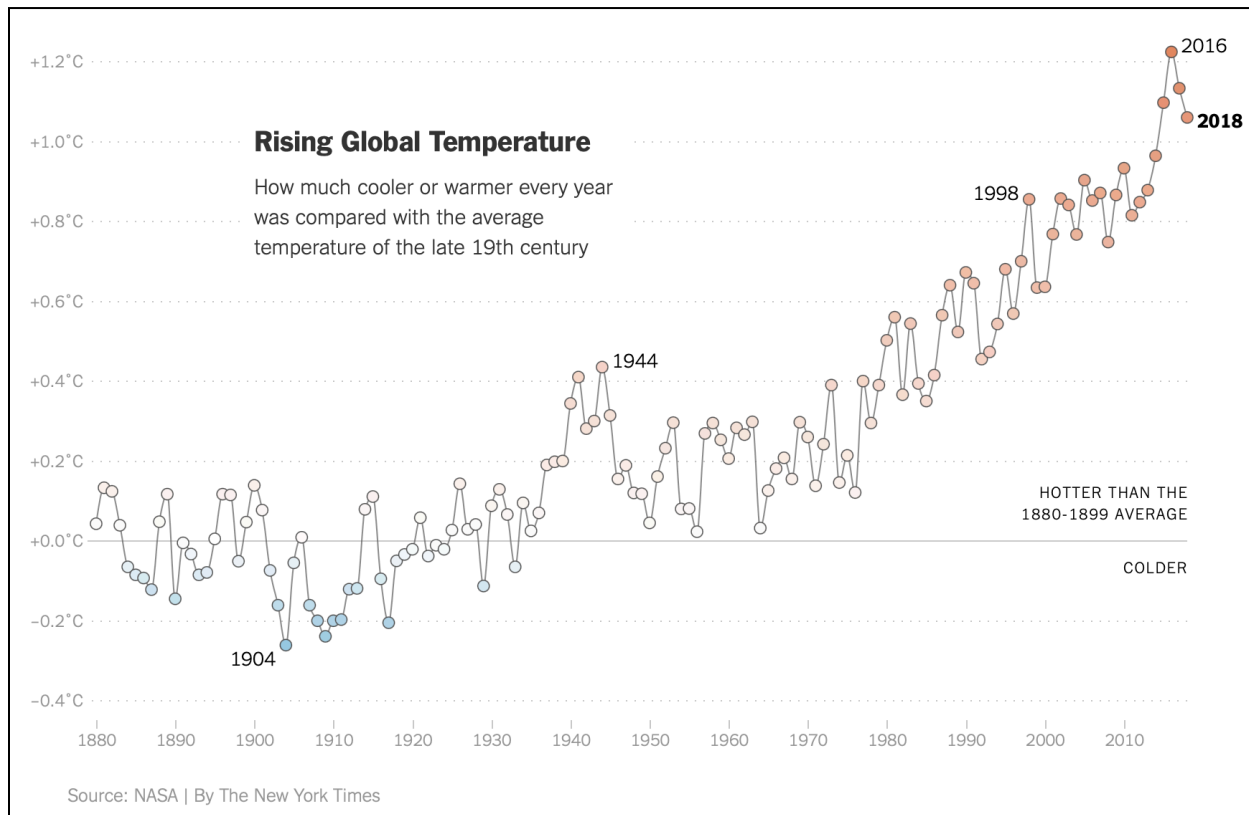
10. What else does this activity make you want to know about?

> *Potential teacher prompts: Are climate threats preventable?*

Rising Global Temperature
DataByte Student Slide Deck
News Story | *NGSS Standard: MS - ESS3 Earth & Human Activity*

Rising Global Temperature

How much cooler or warmer every year was compared with the average temperature of the late 19th century

HOTTER THAN THE 1880-1899 AVERAGE

COLDER

Source: NASA | By The New York Times

Caption. The points on the graph represent average temperature differences from the 1880-1889 average, for each year from 1880 to 2018.

Making Sense

1. What is the first thing you think about or wonder when you see this graph?
   > *Potential teacher prompts: How do the color shades relate to the locations of the points? What general patterns do you notice?*
2. What do you notice in the graph?
   > *Potential teacher prompts: Do you notice a point in time where a significant change appears to occur? Why do you think the temperatures make a zigzag shape?*

Personal Connections

3. Do you have a personal connection with the data or patterns in this graph? Why or why not? Which people or groups do you think would feel more or less of a connection with the data or patterns here?
   > *Potential teacher prompts: What do you notice about the temperatures during your lifetime?*
4. Does this graph help you understand how temperature change affects you? What other information would you want or need to better understand how climate affects

you?

> *Potential teacher prompts: What do you think this graph would look like in 2080?*

5. Why did the designers collect this information and create this graph? What did they want to know?

Context and History

6. What could you do to this dataset/graph to make it more useful for yourself or others who might not be included here? For example, would you collect more data, group or graph the data differently, take different measurements, or focus on certain parts of the data?

    > *Potential teacher prompts: Should this graph show local or regional temperature changes instead of global changes?*

7. What are some reasons for the patterns you see? How might these patterns be different if the data had been collected by different people, or in a different time period?

    > *Potential teacher prompts: Would this graph be interesting to people looking at the data in 1930?*

Future Uses of Data

8. What are some questions you can use this data or graph to answer? What are some questions this data or graph cannot help answer?

    > *Potential teacher prompts: What is the current path telling us about how average global temperatures are changing?*

9. If you had to write an article about temperature change based on this graph, what would the headline be? What might be missing from that article?
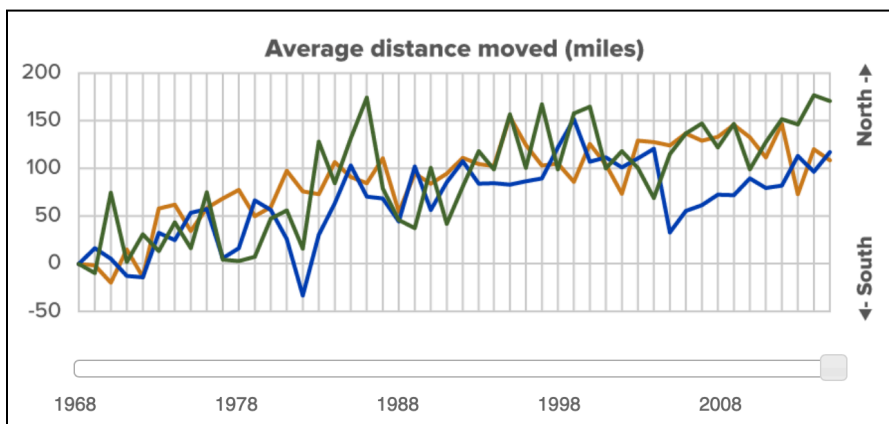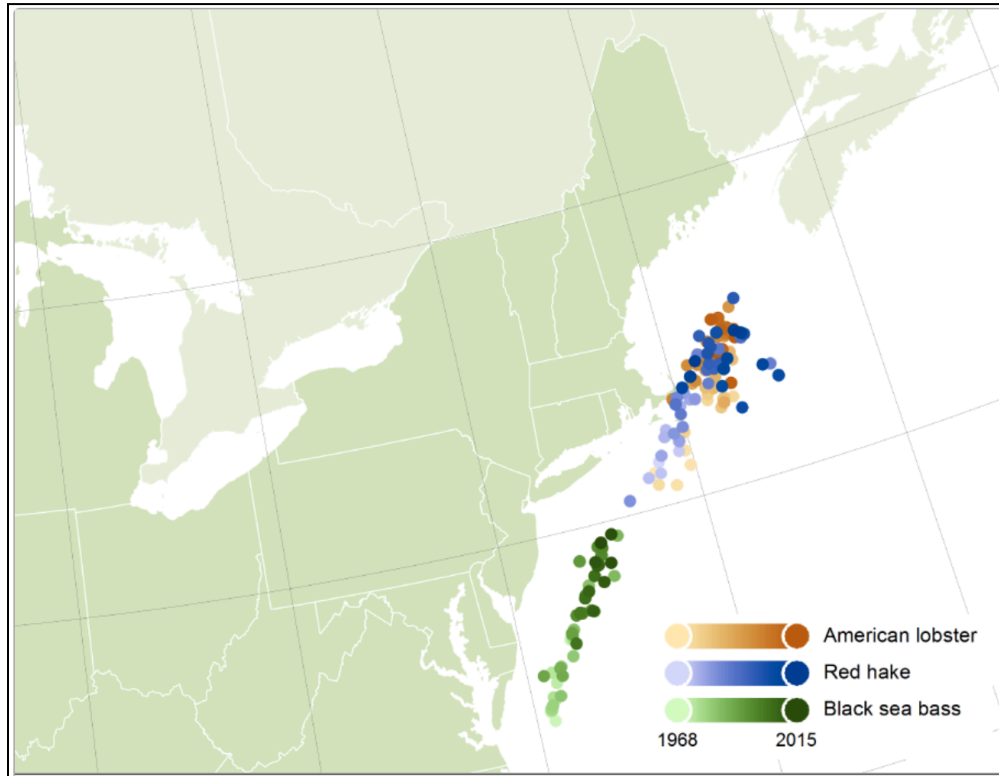
    > *Potential teacher prompts: How might degrees of temperature change affect the environment (relative to the trend you see)?*

10. What else does this activity make you want to know about?

Changes in Fish Habitat

Data Source | *NGSS Standards: MS-LS2 Ecosystems: Interactions, Energy, and Dynamics; ESS3 Earth & Human Activity*

Caption. Changes in 3 types of Fish and Shellfish habitat over time. The map points are the average location per year. The line plot shows more location detail (North & South).

Making Sense

1. What is the first thing you think about or wonder when you see this map and graph?

Potential teacher prompts: What do the colors and different shades of each color mean on the map? What does "distance moved" on the graph mean?

2. What do you notice in the map and graph?

   Potential teacher prompts: How do you think the map and the graph are connected? How are the locations of the different populations changing?

Personal Connections

3. Do you have a personal connection with the data or patterns in this graph? Why or why not? Which people or groups do you think would feel more or less of a connection with the data or patterns here?

   Potential teacher prompts: Do you know anyone that lives in this area? Why might some people care about the lobster, hake, and bass populations? Can you think of other species that are left out that might show a different pattern? Are there places in the world where fish and wildlife might be even more impacted by temperature change?

4. Does this graph help you understand how temperature change affects you? What other information would you want or need to better understand how temperature change affects you?

   Potential teacher prompts: What would it mean if you saw similar patterns in fish habitats in your area? Why does what's happening with lobsters on the East Coast matter for people who don't live there?

Context and History

5. Who do you think made this graph? Why did they collect this information and create this graph? What did they want to know?

   Potential teacher prompts: Why do you think the designers chose these three specific species?

6. What are some reasons for the patterns you see? How might these patterns be different if the data had been collected by different people, or in a different time period?

   Potential teacher prompts: What could be causing the fish and shellfish to move in these patterns? Do you think they have always been traveling these ways?

Future Uses of Data

7. What could you do to this dataset/graph to make it more useful for yourself or others who might not be included here? For example, would you collect more data, group or graph the data differently, take different measurements, or focus on certain parts of the data?

   Potential teacher prompts: Could similar things be happening to the fish and animals that live near us? What local habitats or animals could you explore in this way?

8. What are some questions you can use this data or graph to answer? What are some questions this data or graph cannot help answer?

9. If you had to write an article about fish and shellfish habitat based on this graph, what would the headline be? What might be missing from that article?

10. What else does this activity make you want to know about?

CODAP Interactive DataBytes

These DataBytes come with static visualizations like the ones above. They also feature fully interactive CODAP versions of the datasets and visualizations that teachers and students can use to get deeper into their exploration.

Learn more about how to use CODAP with this online guide for educators, or download this step-by-step PDF intro.

What's Healthy?

Global Temperature Change Predictions

Tracking Elephant Seals

Examining Cereal Labels
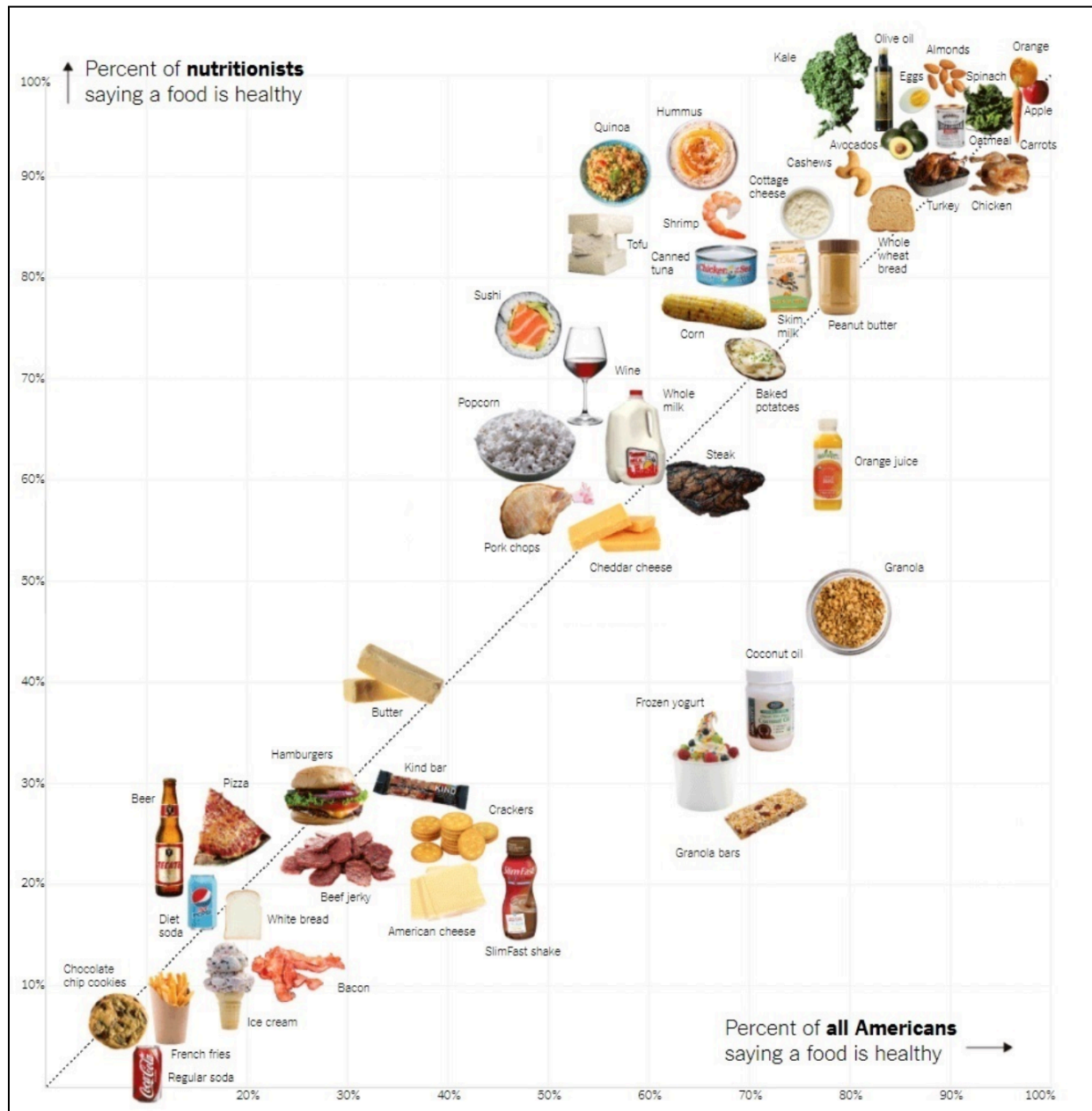
What's Healthy?

Data Source | *NGSS Standards: LS1: From Molecules to Organisms: Structures and Processes*

Bonus: View this DataByte as an **Interactive CODAP file**!

Caption. Different foods plotted by the percent of Americans who say the food is healthy vs. the percent of nutritionists who say the food is healthy. If a food is on the dotted line, that means Americans and nutritionists agree about how healthy or unhealthy the food is.

Making Sense

1. What is the first thing you think about or wonder when you see these graphs?

    Potential teacher prompts: Can you locate any foods that you eat?

2. What do you notice in the graph?

    Potential teacher prompts: Why are some foods far from the line? What might that mean? What can you say about the foods over the line, versus ones that are under the line?

Personal Connections

3. Do you have a personal connection with the data or patterns in this graph? Why or why not? Which people or groups do you think would feel more or less of a connection with the data or patterns here?

    Potential teacher prompts: How might this graph change for people with diet restrictions? Which foods do you think are missing that you may eat? Where do you think your favorite food might be located on this graph?

4. Does this graph help you understand how diet and nutrition affect you? What other information would you want or need to better understand how diet and nutrition affect you?

    Potential teacher prompts: What do you think makes a food healthy or unhealthy?

5. Who do you think made this graph? Why did they collect this information and create this graph? What did they want to know?

    Potential teacher prompts: Do you think this graph represents foods from a particular culture, or a particular part of the world?

Context and History

6. What could you do to this dataset/graph to make it more useful for yourself or others who might not be included here? For example, would you collect more data, group or graph the data differently, take different measurements, or focus on certain parts of the data?

    Potential teacher prompts: Do you think there is a relationship between food cost and its location on the graph?

7. What are some reasons for the patterns you see? How might these patterns be different if the data had been collected by different people, or in a different time period?

    Potential teacher prompts: What might you say about the group of foods towards the lower left of the graph? Do they have anything in common?

Future Uses of Data

8. What are some questions you can use this data or graph to answer? What are some questions this data or graph cannot help answer?

    Potential teacher prompts: Do you think that you can say whether or not your diet is considered healthy based on this graph?

9. If you had to write an article about diet based on this graph, what would the headline be? What might be missing from that article?

    Potential teacher prompts: Where can you purchase these different types of foods?

10. What else does this activity make you want to know about?
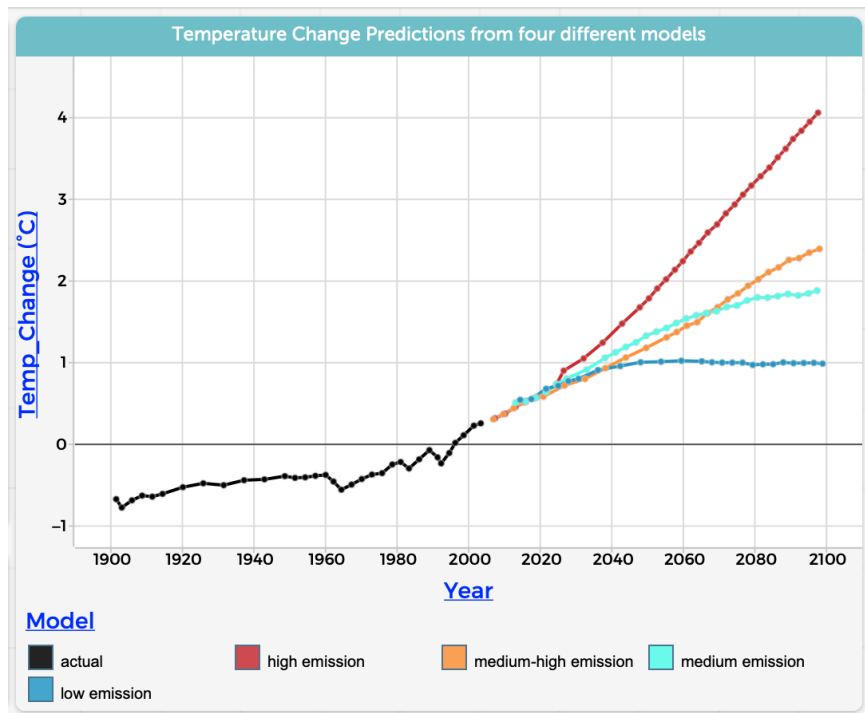
Data WRITING Stories

Potential teacher prompts: What do you think nutritionists consider in calling a food healthy and why do you think there is some disagreement?

Global Temperature Change Predictions

DataByte Slide Deck
Data Source | *NGSS Standard: MS-ESS3 Earth & Human Activity*

Bonus: View this DataByte as an **Interactive CODAP file**!

Caption. The black data points show how the average temperature in a given year compares to the average temperature from 1985-2005. The other data points (from 2005-2100) show potential temperature changes based on 4 different levels of emissions.

Making Sense
1. What is the first thing you think about or wonder when you see this graph?
    Potential teacher prompts: (The actual/known data goes until about 2005) Did this model accurately predict the temperature change up to this year? What are some reasons why the prediction for today could be wrong?
2. What do you notice in the graph?
    Potential teacher prompts: Why do some of the model (or different color) lines overlap? Why do you think the lines spread out as time goes on?

Personal Connections
3. Do you have a personal connection with the data or patterns in this graph? Why or why not? Which people or groups do you think would feel more or less of a connection with the data or patterns here?

Potential teacher prompts: Which age groups of people from today would be most affected by emissions and climate change?

4. Does this graph help you understand how greenhouse gas emissions relate to your life? What else might you want to know about greenhouse gas emissions?

   Potential teacher prompts: What would these temperature changes be in degrees fahrenheit?

5. Who do you think made this graph? Why did they collect this information and create this graph? What did they want to know?

Context and History

6. What could you do to this dataset/graph to make it more useful for yourself or others who might not be included here? For example, would you collect more data, group or graph the data differently, take different measurements, or focus on certain parts of the data?

   Potential teacher prompts: Which locations in the world would be most affected by the different temperature change models?

7. What are some reasons for the patterns you see? How might these patterns be different if the data had been collected by different people, or in a different time period?

Future Uses of Data

8. What are some questions you can use this data or graph to answer? What are some questions this data or graph cannot help answer?

9. If you had to write an article about greenhouse gases based on this graph, what would the headline be? What might be missing from that article?

10. What else does this activity make you want to know about?

Tracking Elephant Seals

Bonus: Engage with data for this DataByte as an **Interactive CODAP file**!
Data Source | *NGSS Standards: MS-LS2 Ecosystems: Interactions, Energy, and Dynamics; ESS3 Earth & Human Activity*
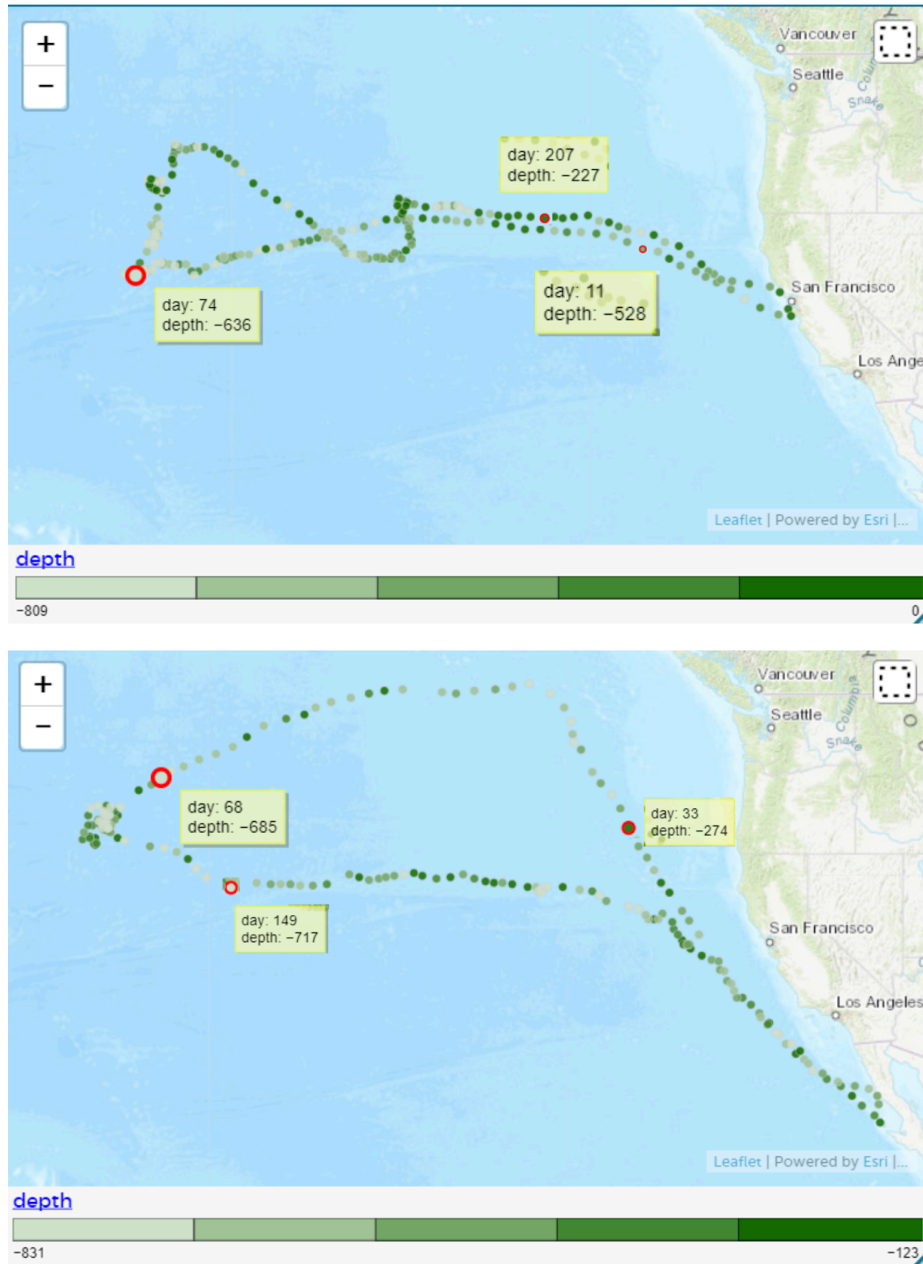
Caption. The track of two elephant seals' location from late May through early January. One started and ended near San Francisco, and another from the Baja California Peninsula. The shades of green represent the daily average depth of the elephant seal below sea level.

Making Sense

1. What is the first thing you think about or wonder when you see these graphs?

   Potential teacher prompts: What do you think the dots represent? The color of the dots? What does the information about days tell you about the elephant seals?

2. What do you notice in the graph?

   Potential teacher prompts: In what ways are the paths of these two elephant seals similar and different from one another?

Personal Connections

3. Do you have a personal connection with the data or patterns in this graph? Why or why not? Which people or groups do you think would feel more or less of a connection with the data or patterns here?

   Potential teacher prompts: Do you recognize any of the areas on the map? Have you ever seen or heard about elephant seals?

4. Does this graph help you understand how elephant seals are connected to our world? What other information would you want or need to better understand how elephant seals affect your area?

   Potential teacher prompts: What do you know about the ocean and land these seals visit? What might be happening in those places that could affect the seals?

5. Who do you think made this graph? Why did they collect this information and create this graph? What did they want to know?

Context and History

6. What could you do to this dataset/graph to make it more useful for yourself or others who might not be included here? For example, would you collect more data, group or graph the data differently, take different measurements, or focus on certain parts of the data?

   Potential teacher prompts: Would you be interested in the migration patterns of other animals? Are there other things you would like to know about these seals as they travel?

7. What are some reasons for the patterns you see? How might these patterns be different if the data had been collected by different people, or in a different time period?

Future Uses of Data

8. What are some questions you can use this data or graph to answer? What are some questions this data or graph cannot help answer?

9. What story could be told from this graph about elephant seals? What might be missing from that story?

10. What else does this activity make you want to know about?

Examining Cereal Labels

Bonus: Engage with data for this DataByte as an **Interactive CODAP file**!
NGSS Standards: LS1: From Molecules to Organisms: Structures and Processes
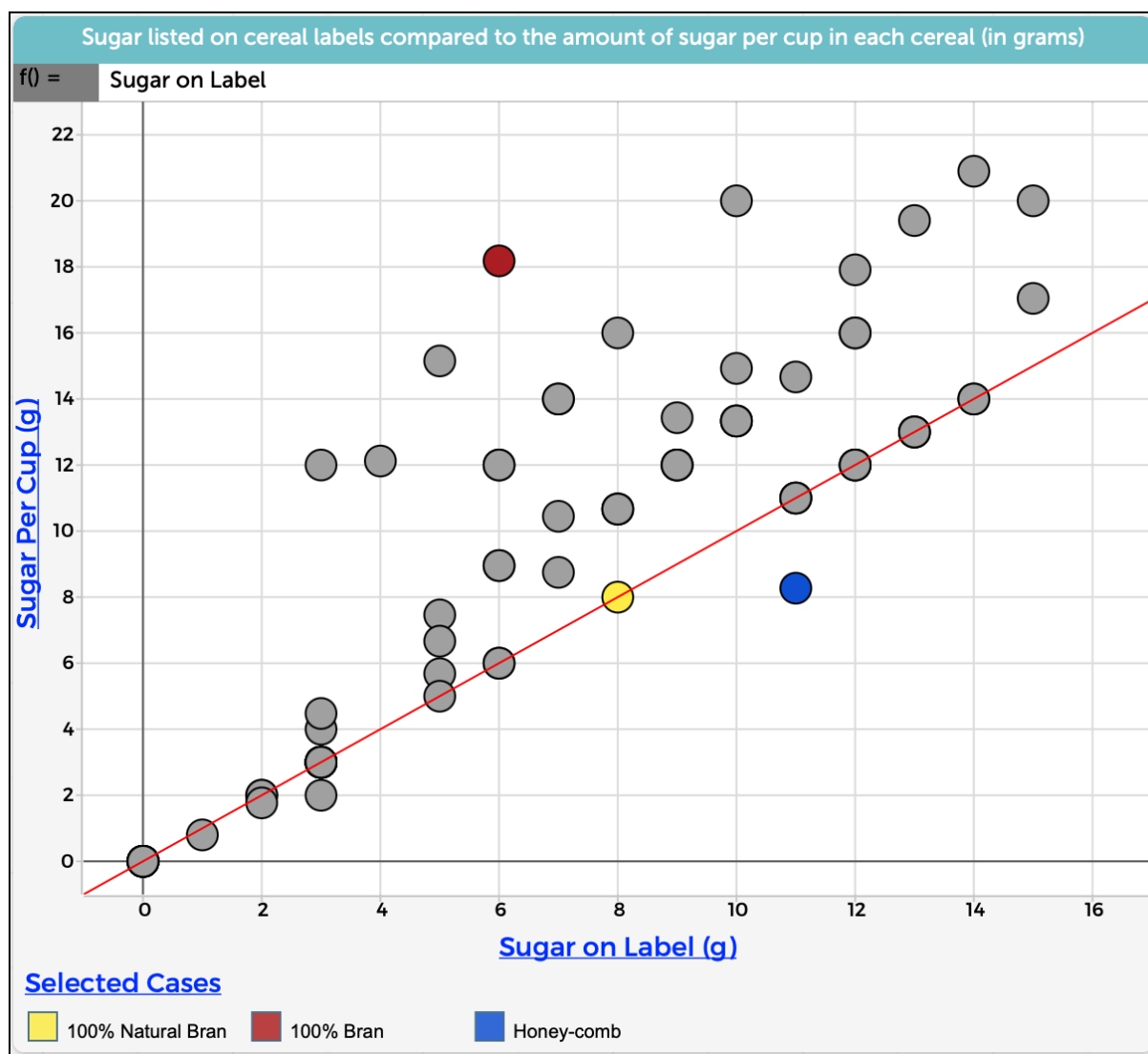
Caption. The graph shows the amount of sugar listed on cereal labels compared to the amount of sugar contained in a cup of the cereals (in grams). If a cereal is on the line, then the sugars on the label match the sugars per cup. Three cereals above, below, and on the line are colored.

Making Sense
1. What is the first thing you think about or wonder when you see these graphs?
   Potential teacher prompts: What do you think the red line represents? Why do you think most of the cereals (points) are above the line?

2. What do you notice in the graph?

   Potential teacher prompts: What would you say about the "selected cases" cereals based on this graph?

Personal Connections

3. Do you have a personal connection with the data or patterns in this graph? Why or why not? Which people or groups do you think would feel more or less of a connection with the data or patterns here?

   Potential teacher prompts: Do you ever look at cereal labels, or other food labels? What do you look for on the labels?

4. Does this graph help you understand how diet and nutrition affect you? What other information would you want or need to better understand how diet and nutrition affect you?

   Potential teacher prompts: Would you change what you look at on nutrition labels based on what you notice in this graph?

5. Who do you think made this graph? Why did they collect this information and create this graph? What did they want to know?

   Potential teacher prompts: Would cereal companies be likely to look at their nutrition labels this way? How about a nutritionist, or a consumer (or you)? Why or why not?

Context and History

6. What could you do to this dataset/graph to make it more useful for yourself or others who might not be included here? For example, would you collect more data, group or graph the data differently, take different measurements, or focus on certain parts of the data?

   Potential teacher prompts: Do you think one cup of cereal is a good amount to consider? How many cups of cereal do you/would you put in your bowl of cereal? If different from a cup, would that be a better measure? Why or why not?

7. What are some reasons for the patterns you see? How might these patterns be different if the data had been collected by different people, or in a different time period?

   Potential teacher prompts: Do you think the graph would change if cereals did not have nutrition labels? If so, how so?

Future Uses of Data

8. What are some questions you can use this data or graph to answer? What are some questions this data or graph cannot help answer?

   Potential teacher prompts: Does this graph help you choose a cereal, if you could look up the cereal names of each point? Where do you think your favorite cereal is on this graph, if you have one? How about another breakfast food that you eat?

9. If you had to write an article about diet based on this graph, what would the headline be? What might be missing from that article?

   Potential teacher prompts: Do you think that cereal nutrition labels are misleading? Should there be a standard serving size for cereals, or other foods?

10. What else does this activity make you want to know about?

    Potential teacher prompts: Why do foods have nutrition labels? Should the sugar amount on nutrition labels also have a percent daily value, like other nutrients?

Data WRITING Stories

DIY DataBytes Toolkit

Here you'll find tools and resources to help construct your own DataBytes. Have fun!

Places to Find Data Visualizations

New York Times
https://www.nytimes.com/2017/10/09/learning/whats-going-on-in-this-graph-oct-10-2017.html

Turner's Graph
https://www.turnersgraphoftheweek.com

Data Talks
https://www.youcubed.org/resource/data-talks/

Statista
https://www.statista.com/chart/12541/the-state-of-freedom-worldwide/

Generic Questions to Adapt as You'd Like

We recommend especially using starred questions (★) to establish a baseline understanding, and to cover all four dimensions of the DataByte process.

Making Sense of Data
Get students noticing and wondering about trends in the data or visualization, what these patterns mean, and how they connect to key science concepts.

1. What is the first thing you think about or wonder when you see this graph?
2. ★ What do you notice in the graph? What mathematical tools, ideas, or patterns do you see represented?

Building Personal Connections with Data
Explore how students' lives and communities may be impacted by, reflected within, or excluded by the data and visualization.

3. Does this graph help you understand how [science concept] affects you? What other information would you want or need to better understand how [science concept] affects you?
4. ★ Do you have a personal connection with the data or trends in this graph? Why or why not? Which people or groups do you think would feel more or less of a connection with the data or trends here?

Reflecting on the Context and History of Data
Explore when and how data were collected, by whom (including who/what gets "counted" and why), how it is visualized, what might be missing or hidden.

5. ★ Who do you think made this graph [*if not in the description*]? Why did they collect this information and create this graph? What did they want to know?
6. How might these trends be different if the data had been collected by different people, or in a different time period?

Envisioning Future Uses of Data
Expand the investigation, include and explore different perspectives, and use data to highlight the importance of what's happening in the world around us.

7. What could you do to this dataset/graph to make it useful for more people or purposes? For example, would you collect more data, take different measurements, group or graph the data differently, or do other things?
8. What are some questions you can use this data or graph to answer? What are some questions this data or graph *cannot* help answer?
9. ★ If you had to write an article about [science concept] based on this graph, what would the headline be? What might be missing from that article?

Next Steps

10. What else does this activity make you want to know about?

Generic Questions (Spanish Translation)

Dar sentido a los datos

1. ¿Cuál es la primera cosa que te hace pensar en esta gráfica?
2. ★ ¿Qué es lo que ves en esta gráfica? ¿Qué herramientas, ideas o patrones matemáticos ves representados?

Construyendo conexiones personales con datos

3. ¿Te ayuda esta gráfica a comprender cómo el [concepto científico] te afecta a ti? ¿Qué otro tipo de información querrías o necesitarías para entender mejor cómo te afecta el/la [concepto científico]?
4. ★¿Tienes una conexión personal con los datos o patrón de datos en esta gráfica? ¿Por qué sí o por qué no? ¿Cuáles grupos de gente o comunidades piensas que están conectadas con los datos?

Reflexionando sobre el contexto y la historia de los datos

5. ★ ¿Quién crees que hizo este gráfico [*si no está en la descripción*]? ¿Por qué recopilaron esta información y crearon este gráfico? ¿Qué querían saber?
6. ¿Cómo serían diferentes las tendencias de los datos si otra gente los hubiera colectado, o si fuera en un período de tiempo diferente?

Pensando de usos futuros de los datos

7. ¿Que le podrías hacer a los datos/la gráfica para que sea(n) más util para ti o para otros que podrían no estar incluidos aquí? Por ejemplo, colectarías más datos, agruparías o graficarías los datos de manera diferente, tomarías diferentes mediciones, o te enfocarías en diferentes partes de los datos?
8. ¿Cuáles son algunas preguntas que puedes utilizar estos datos o gráficos para responder? ¿Cuáles son algunas preguntas que estos datos o gráficos no pueden ayudar a responder?
9. ★ Si tuvieras que escribir un artículo sobre [concepto científico] basado en este gráfico, ¿cuál sería el título? ¿Qué podría faltar en ese artículo?

Próximos pasos

10. ¿Qué más te gustaría saber después de hacer esta actividad?

Data WRITING Stories

Glossary of Common Visualization Terms

Axis (eje) - An axis is a line with numbers and a label. You can use the axis of a graph to find out what the height or position of points, bars, lines, or other parts of a graph mean in terms of measurement.

Caption (subtítulo) - A caption is the text below or to the side of a graph or image that tells you what the graph or image shows.

Data (datos) - Data are numbers, words, or other information that someone collects to better understand something in the world. Data can be organized into tables or graphs.

Legend (leyenda) - A legend tells you what different colors, shapes, or other parts of a graph mean.

Outlier (un valor atípico) - An outlier is a point that is far from the other points in a graph or does not fit in the overall shape of the graph.

Pattern (patrón) - A pattern is something that you recognize on a graph or in data. It can be a repeating number of shapes, or it can be that a whole graph matches a shape you recognize and can easily describe, such as going smoothly up or going up with a curve.

Points (puntos) - Points are dots on a graph that show you information about a specific observation. Usually the position of the dot tells you information, but sometimes also the color or size of the dot means something important too.

Relationship (relación) - Things are related when they change together. For example, one thing might get bigger as another gets smaller, or they might both get smaller and bigger together.

Scale (escala) - The scale of a map or graph tells you how big measurements or distances are. For example, a map uses a scale to tell you how far two places on the map actually are from one another. Sometimes graphs use scale to make it easier to understand very big or very small numbers.

Trend (tendencia) - A trend is the way that things continue to change *in general*, even if there are some small differences in the overall change.

Variable (variable) - is a type of information we can count, measure, or categorize. Variables can be used to compare information about different things. They do not tell us why there are differences, but they can be helpful for finding relationships or patterns.

Glosario de palabras comunes de visualización

Datos (data): los datos son números, palabras u otra información que alguien recopila para comprender mejor algo en el mundo. Los datos se pueden organizar en tablas o gráficos.

Eje (axis): un eje es una línea con números y una etiqueta. Puede usar el eje de un gráfico para averiguar qué significan la altura o la posición de puntos, barras, líneas u otras partes de un gráfico en términos de medición.

Escala (scale): la escala de un mapa o gráfico le indica qué tan grandes son las medidas o distancias. Por ejemplo, un mapa usa una escala para decirle qué tan lejos están realmente dos lugares en el mapa entre sí. A veces, los gráficos utilizan una escala para facilitar la comprensión de números muy grandes o muy pequeños.

Leyenda (legend): una leyenda le dice qué significan los diferentes colores, formas u otras partes de un gráfico.

Patrón (pattern): un patrón es algo que reconoce en un gráfico o en los datos. Puede ser un número repetido de formas, o puede ser que un gráfico completo coincida con una forma que reconozca y pueda describir fácilmente, como subir suavemente o subir una curva.

Puntos (points): los puntos son puntos en un gráfico que le muestran información sobre una observación específica. Por lo general, la posición del punto le da información, pero a veces también el color o el tamaño del punto significa algo importante.

Relación (relationship) - Las cosas se relacionan cuando cambian juntas. Por ejemplo, una cosa puede hacerse más grande a medida que otra se hace más pequeña, o ambas cosas pueden volverse más pequeñas y más grandes juntas.

Tendencia (trend): una tendencia es la forma en que las cosas continúan cambiando en general, incluso si hay algunas pequeñas diferencias en el cambio general.

Subtítulo (caption): un título es el texto que se encuentra debajo o al lado de un gráfico o imagen que le dice lo que muestra el gráfico o la imagen.

Variable (variable): es un tipo de información que podemos contar, medir o categorizar. Las variables se pueden usar para comparar información sobre diferentes cosas. No nos dicen por qué existen diferencias, pero pueden ser útiles para encontrar relaciones o patrones.

Un valor atípico (outlier): un valor atípico es un punto que está lejos de los otros puntos en un gráfico o que no encaja en la forma general del gráfico.

Suggestions for Language Support

For any of these strategies, you might develop definitions as a class or have students work on definitions in pairs or groups first. We recommend encouraging students to keep a multilingual personal dictionary where they add terms, cognates, and examples.

As you come across important words, ask students to use context clues from how the word is used to develop a definition.

Work together to define the words in English and any other language or mode of expression that is helpful to students.

Have students use the word in their own sentence.

If appropriate, ask for an example of each word.

Ask students to draw or find and discuss an image of the words or phrases.

If students know the meaning of the cognate in other languages - for example, *datos* or *patrones* in Spanish - discuss what they mean and then work with students to define the English word using their own words in any language.

Have students circle words they do not know. Have students or groups develop a definition using any language, then come together as a class to work on a definition in English and a language that is helpful to students.

Consider providing the [Glossary of Common Data Terms](#) ([also available in Spanish](#)) to students, or referencing it together in class.

About Us

If you have any questions about the project, are interested in collaborating with us, or would otherwise like more information, please contact us at writingdatastories@berkeley.edu or mwilkers@berkeley.edu.

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