LESSON

Analyzing Patterns in Voter Data

Grade Levels: 9-12
Duration: 90 min

In this data science lesson students will analyze voter data from around the world, as well as the United States. They apply their computational thinking skills and use a web-based data science tool to analyze, graph, and map the data. Students then take on the role of data journalists to share the story of their data with others.

Outline

Frame the Challenge	10 min total
Activate Prior Knowledge	5 min
Introduce Computational Thinking and Data Science	5 min
Unplugged Challenge	**20 min total**
Voter Turnout Around the World	5 min
Card Sorting	10 min
World Tour	5 min
Plugged Design Challenge	**60 min total**
Introduce CODAP	10 min
Introduce the Data on CODAP	5 min
Explore the Data on CODAP	20 min
Craft the Story	10 min
Tell the Story of the Data	10 min
Debrief	5 min

Grade Levels: 9-12

Duration: 90 min

Concepts/Skills

Data science, voter turnout, analyzing and interpreting data, computational thinking, pattern recognition, abstraction, storytelling

Objectives

Students will:

- Interpret graphs and maps.
- Use computational thinking skills such as pattern recognition and abstraction.
- Analyze a data set by creating maps and graphs with a web-based data science tool.
- Share their analysis with others and receive feedback.

Materials and Preparation

Educator Resources	Team Resources *(per team of 2-3 students)*

• Some means of projecting from the educator's computer
• **Analyzing Voter Data** Lesson Slides
  – Facilitation Slides
  – Three Slide Story Template
• **The Tech Interactive Analyzing Voter Data, data set on CODAP:** bit.ly/tech-CODAP-voter-data (Common Online Data Analysis Platform)
• (*Optional*) Computational Thinking Elements posters (English, Spanish)
 	
Preparing to Use CODAP
• "For Educators: Teaching with CODAP," The Concord Consortium
• "Getting Started in CODAP, Part 1," a beginner's tutorial
• "Getting Started in CODAP, Part 2," advanced tutorial
	• Country Voting Case Cards *(1 set per team)*
	• Computer/device with internet access
	• Scratch paper and writing utensils

Preparation

1. Collect, organize, and set up materials.
   - Print the Country Voting Case Cards on one side. Precut or make a plan to have students cut the cards themselves. You will need one set (21 cards) for each team of 2-3 students.
   - Each group will also need a device with an internet connection.
2. Try using CODAP yourself. This will give you experience with the tool so that you can anticipate student questions.
   - See Educator Resources above for the Getting Started tutorial and other tips.
3. Determine how you will divide students into teams of two to three for the activity.

Adaptations for Distance Learning

- Have students use Jamboard, Google Slides, or other collaborative tools to share their work.
- Use break-out rooms during a synchronous video call for team work and exploration of CODAP.

Tech Tips

See our educator guides and videos for more design challenge facilitation techniques.
For this lesson check out:

- Computational Thinking Tech Tip

Background Information

Pedagogy and Approach

At The Tech we place a special emphasis on using computational thinking skills (such as pattern recognition and abstraction) as a foundation for making sense of data. These skills allow students to analyze information about topics they care about and familiarize themselves with different approaches for answering complex questions. This method supports students' development of problem-solving skills and prepares them for future STEM careers.

Data Science

Data is everywhere. Large datasets are used in everything from journalism to public health and the ability to navigate and understand data is becoming increasingly important. **Data science** involves humans and computers collecting, processing, analyzing, and utilizing data to understand and solve problems. This lesson provides students with the opportunity to build skills in **data literacy**, computational thinking, and computer-based data analysis.

Data scientists identify patterns and discrepancies and draw conclusions — skills that are strongly rooted in computational thinking. Rather than approach data with preconceived notions, or adopt information as it is provided, students are encouraged to question assumptions and push for understanding.

- *What am I noticing? What patterns do I see? What seems out of place?*
- *What conclusions can I draw?*
- *What additional questions come up when I look at this data?*
- *What data am I using to answer my questions? What other types of data or information might I use?*
- *What do I know about this data? Who and what is included or excluded from the data? When, where, and how was it collected?*

It is important to note that coming to **statistically reliable conclusions** requires large amounts of data and repeated analysis. In this lesson, rather than looking for causation or assuming correlation, students will explore the data and ask questions. *For example*, if students notice that two attributes seem to create a pattern, use the opportunity to discuss what other evidence they may need to better understand how the two are related. There may be other factors that are impacting both attributes, so students should be careful about making causal statements or assumptions about cause.

Correlation vs. Causation
Remember that correlation does not equal causation. Noticing a relationship may mean that there's something worth investigating more.

Causation	Correlation
One event causes another event to occur. A change in one attribute has a direct impact on the other one.	There is a relationship or pattern between the values of two attributes.
For example: An increase in temperature causes ice cream sales to increase.	*For example:* Ice cream sales and air conditioner sales both increase and decrease at the same time. But one does not cause the other to increase.

Focus on the patterns you notice and the questions they raise, **not** proving the cause of those patterns.

The Datasets Used in this Lesson

The data used in this lesson has been simplified so it is easier to understand and analyze. For example, we have taken a larger dataset and focused on just one **attribute** – the percentage of the voting age population who vote. This information, as well as the contextual details of how it was collected, can be shared with students.

International Voting Dataset

The data for the country cards were compiled from two datasets (compulsory voting and voting age population turnout) from the **International Institute for Democracy and Electoral Assistance (International IDEA)**. They collect their data from national electoral management bodies (EMBs) and national statistical bureaus of countries as well as secondary sources.

- The country data references the most recent parliamentary or presidential election (as of February 2022).
- If both elections happened in the same year and the voting age population percentages were different, the presidential data is shared here. (Voter turnout in presidential elections was typically higher, but only by a very small margin.)

Contextual details:

- **Who:** Anyone within the voting age of that country
- **What:**
  - Percentage of voting age population who voted
  - Whether voting is compulsory (mandatory) in that country? (yes/no)
  - If there are sanctions to enforce compulsory voting, are they enforced? (yes/no)
- **When:** Most recent parliamentary or presidential election (between 2018 and 2021)
- **Where:** National elections databases (International IDEA)
- **Why:** To reflect diverse experiences of democracy around the globe
- **How:** Collected by International IDEA from each country's elections board and database

United States Voting Dataset

The data for the CODAP file used in this lesson came from the **Current Population Survey's November Voting and Registration Supplement** conducted by the United States Census Bureau. For this lesson we used Table 4C and focused on age.

Contextual details:

- **Who:** Individuals 18 years of age or older in about 54,000 households
- **What:** Voting and registration behavior during the 2020 election. This lesson focuses on data collected when participants were asked who is registered to vote, who voted, and their age.
- **When:** November 15-24, 2020
- **Where:** Across the U.S.
- **Why:** To inform others about who is or is not voting, and any related factors
- **How:** The survey is administered either in person and or via telephone to a sample that is representative of census demographics and unemployment conditions.

The Tech Academies

This lesson was developed in partnership with educators from **The Tech Academies Fellowship program**. Tech Academy Fellows learn to be leaders of engineering education while designing and testing STEM resources to be shared with other educators.

Frame the Activity

Activate Prior Knowledge *(5 min)*

1. Begin by conducting an anonymous poll of students. (Use a digital tool like Quizlet or Poll Everywhere or have students submit their responses via sticky notes.)
   - Ask them: *On a scale of 1-10, 10 being most important, how important do you think it is for people to vote?*
2. Have students estimate the **voter turnout** (percentage of eligible voters who participated in an election) for the United States in 2020.
3. After informing them it was 70.75%, lead a short discussion about voter turnout.
   - *Why do people vote? Why **don't** they?*
   - *Why do you think voting is important (or not)?*
   - *What are some factors that might affect voter turnout?*
4. Encourage students to notice the difference between opinion versus evidence-supported arguments by asking:
   - *How do you know? (What evidence or data do you have to support this idea?)*
   - *How could you find out? (What evidence or data could you look for to support this idea?)*

Introduce Computational Thinking *(5 min)*

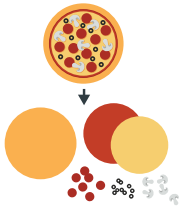
1. Understanding who votes and why are questions that computer scientists and data scientists around the world examine every election cycle. In this lesson students will be applying the computational thinking skills used to analyze this real-world problem.
2. Make sure students understand what **data science** is. Have them share some examples of places they have seen data used (i.e., election polling, social media marketing, surveys, etc.).
3. Next, introduce the two **Computational Thinking** skills they will use as they explore their data: **pattern recognition** and **abstraction**. Options include:
   - Project the **Investigating Voter Data** **Lesson Slides** (Slides 4-6)
   - Print and post the **Computational Thinking Elements posters** (**English**, **Spanish**).
4. Have students provide some examples of ways that they use these computational thinking skills in their life, and how they might use them when analyzing data.

   For example:
   - Pattern recognition: Noticing and identifying trends and unusual values in data
   - Abstraction: Summarizing, highlighting the most important data points

Computational Thinking

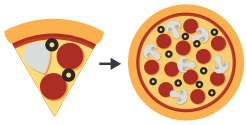
Computational thinking is a problem-solving process that uses everyday skills and tools: abstraction, decomposition, pattern recognition, and algorithms. If students need an example of each computational thinking skill, refer to our **Computational Thinking Tech Tip** or use an example like this:

Decomposition



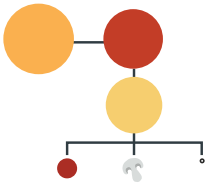
What are the different parts that create this?

Abstraction



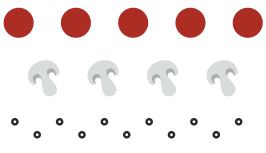
How do you know what this is?

Algorithm



What steps do you need to follow to create this?

Pattern Recognition



Do you notice anything that repeats?

Unplugged Challenge

Voter Turnout Around the World *(5 min)*

1. Let students know that to examine questions about voter turnout they will first look at data from different countries.
2. Explain that you will be giving them cards with data from 21 different countries around the world.
3. Hold a card up or project the **Investigating Voter Data** Lesson Slides (Slide 7) and point out that the cards all include the same attributes, or information gathered about each country.
4. Ask the students to help define the attributes. *For example:* What do you think *"compulsory voting"* means?

Attributes and Definitions for the Country Voting Case Cards

Recent Election Year:
- Year of the most recent election, (as of February 2022)

Voting Age Population (VAP) Turnout:
- The percentage of those who voted, out of all the eligible people who were old enough to vote

Compulsory Voting:
- Is voting required by law in this country? (Yes or No)

Sanctions Enforced:
- Are there rules or laws that are used to make sure people vote? (Yes or No)

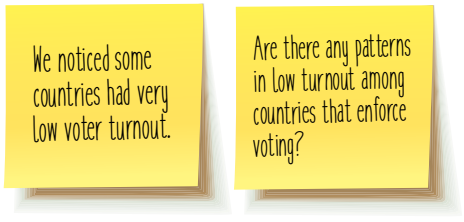
ARGENTINA	
Recent Election Year	2021
Voting Age Population Turnout	72.57%
Compulsory Voting	Yes
Sanctions Enforced	Yes

Sample card

5. Let students know that all of the countries they will look at have compulsory voting, except the U.S.
   - If students want to know more about the data, you can explain that the types of sanctions used to enforce voting varies from country to country. They will not look into these details in this activity.

Card Sorting *(10 min)*

1. Introduce the card sorting activity. Let students know that they will use computational thinking to sort and analyze a set of cards as a team.

Step 1: Use **pattern recognition** to sort and analyze the cards.	
Step 2: Use **abstraction** to summarize your work: • Include at least one thing you noticed. • Include at least one question that you still have. Write each idea on a sticky note.	

2. Remind students that there is no correct answer in this activity. This is an open-ended exploration, so each team's work may look very different. The goal is to focus on the process they use, not the answers they come up with.
3. Divide students into teams of two to three students and pass out a set of cards, sticky notes, and writing utensils to each team.
4. Give students 7-10 minutes to sort and summarize their cards. Have them place their sticky notes next to their cards when they are finished.

World Tour *(5 min)*

1. Give learners a few minutes to stand up, walk around, and look at each other's sorted cards and sticky notes.
2. Then have them return to their seats and discuss what they noticed:
   - *What patterns did you use to sort your cards?*
   - *What did you notice?*
   - *What questions do you still have?*
   - *How did different teams organize the data?*
     - *Why do you think they did it that way?*
     - *How did you notice computational thinking, pattern recognition, and abstraction being used?*

Data Science Tip: Contextual Details

As students begin to examine the different countries, they may begin to notice communities that are missing or not represented. Evidence of inequities can begin to surface.

This may be a useful time to introduce the practice of asking about the context of the dataset **(who, what, when, where, why and how).**

- *Who is this data about? Who was included? Who was not?*
- *What is included in the data? What is not?*
- *When was it collected?*
- *Where was it collected?*
- *Why was it collected? (Did someone have a specific goal they wanted to achieve with the data?)*
- *How was it collected?*

Asking these questions and keeping this contextual information in mind when analyzing data can help avoid false assumptions and uncover gaps in the information.

Plugged Design Challenge

Introduce the Plugged Challenge *(5 min)*

1. Let students know that now that they have explored some data about voting around the world, they will look more closely at voter turnout in the United States.
2. To build engagement and connect the activity to the real world, use the following scenario:

*Your team of **data journalists** is analyzing and reporting on voter turnout. You are using data to examine trends in voting.*

- *Use **pattern recognition** to examine voter turnout data, graph and map a few attributes (voter turnout and age).*
- *Use **abstraction** to share the story of what you have discovered in a 3 Slide Story (similar to a social media style).*

- See **What is data journalism?** for videos, articles, or news sites to share with students about the work of data journalists.

3. The activity is outlined as a design problem, with criteria and constraints below. Explain it to students and address any questions they might have.

Design Problem	Explore data about voter turnout in the United States. Tell a story about what you discover. Include any of your remaining questions and suggestions for further investigation.	
Criteria	• Use **pattern recognition** as you analyze the data. • Use **abstraction** to summarize your findings in a 3 Slide Story. – Screenshot of Graph/Map (1) – Screenshot of Graph/Map (2) – Question	 
Constraints	• Use the data provided in CODAP. • You have 30 minutes.	 

4. Learners can continue working in the same teams as in the previous activity. Each team will need access to a computer that is connected to the internet.

What is Data Journalism?

Data journalism or data-driven journalism is the process of analyzing large data sets for the purpose of creating or elevating a news story. Students may notice the use of data journalism in the graphs and charts they see in news articles, on news channels, and even on social media.

Data journalists...

- Analyze large data sets for a news story.
- Use interviews, visualizations, charts, and graphs.
- Help the public understand complex situations.
- Work with computer scientists, statisticians, and designers.

Data journalism brings together the skills of computer scientists, statisticians, journalists, and even designers. In many cases, data journalists have the goal of helping the public understand patterns and make decisions based on the data presented. They often highlight inequalities and use visualizations to create a clear understanding of a complex situation.

Real World Examples

- "The Age of Insight: Telling Stories with Data," Google News Initiative (4:16 min)
- "From Spreadsheets to Headlines: A Day in the Life of Data Journalist Ryan Struyk," ***This is Statistics*** article
- "What is Data Science?" YouCubed (8:23 min)

Data Journalism Sites

- Our World in Data
- What's Going On in This Graph?, a *New York Times* data archive
- Five Thirty Eight
- Flowing Data
- Data Journalism, a Google News Initiative

Introduce CODAP *(10 min)*

1. Point out to students that when asking a big question like this one, they need a large set of data. Notice that computer programs are the easiest way to analyze and interpret large data sets.
2. Introduce CODAP as the computer program and tool that students will be using to analyze their data. CODAP was developed specifically to support students who are learning data science. It is free and web-based.
   - Project the CODAP website to show students how to navigate the tool and find the tutorials. Show students the website and links to access the tutorials.
3. Begin by having each team do the different tasks provided in the CODAP tutorials.
   - **Getting Started in CODAP, Part 1**
   - *(Optional)* **Getting Started in CODAP, Part 2**
4. Address student questions and check their understanding before moving on to the next activity.

Extension: CODAP Challenge Cards *(30-60 min)*

Provide more time for students to become familiar with using CODAP through the use of CODAP Challenge Cards designed by TERC (Technical Education Resource Centers).

These cards can be printed or accessed online. They can be used with any data set. Each card includes a "data move" challenge and a "hint" on the back.

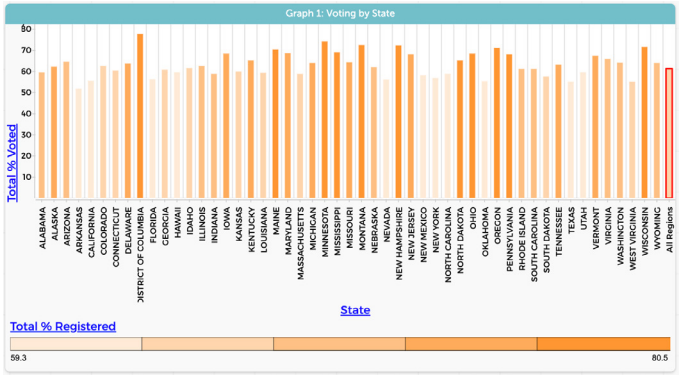
- **CODAP Challenge Cards (to share virtually)**
- **CODAP Challenge Cards (printable version)**

Introduce the data on CODAP *(5 min)*

1. Provide students with the link to the The Tech Interactive Analyzing Voter Data, data set on CODAP: **bit.ly/tech-CODAP-voter-data**.
2. Project your screen to review the directions for analyzing the data.

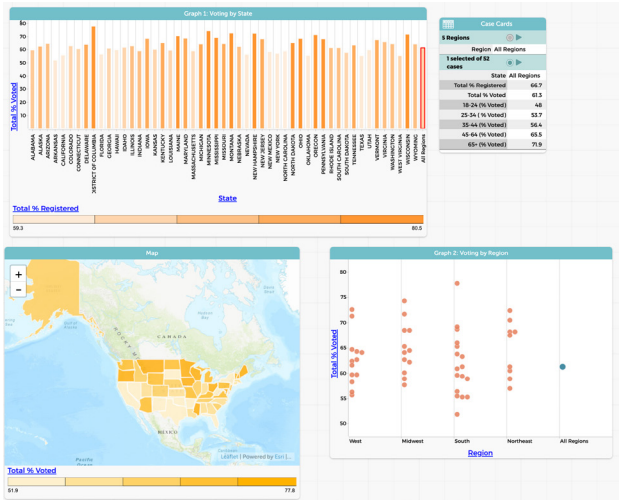
Step 1:
Using *Graph 1: Voting by State*, explore the total percentage of people voting in each state.
What do you notice? What do you wonder?

- Point out that when students hover over the bars they can see the details of the data.



Step 2:
Click on a bar on *Graph 1: Voting by State* to highlight that state on the *Map*, *Graph 2*, and *Case Cards*. Is there anything else you notice by looking at these other visualizations?

- Students may need to scroll up down or side-to-side to see each visualization.
- Remind them that they can select or highlight more than one data point at once by clicking and dragging their mouse. (Holding down shift when clicking will also allow them to select multiple data points on the graphs or map.)

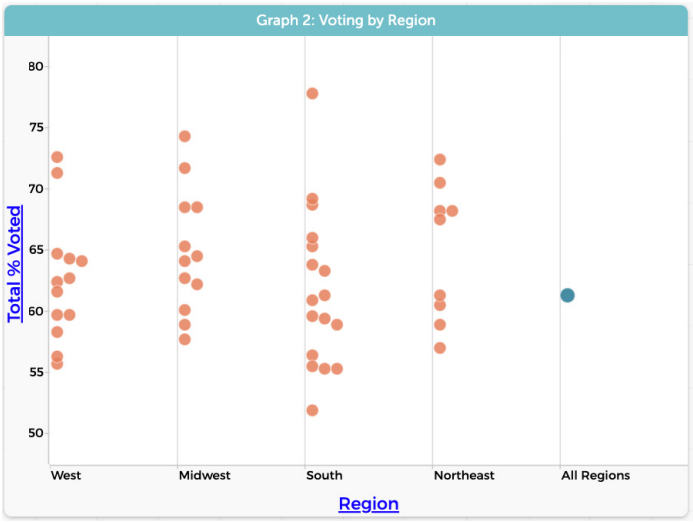


Step 3:
Dive deeper into the voting patterns of specific age groups across the U.S. by swapping out the categories on the *Map* or Y-axis of *Graph 2: Voting by Region*.

- Make sure students are only changing the Y-axis on *Graph 2*. Region should stay on the X-axis for this investigation.

If students need ideas of what to look for, refer to some of the questions provided:

- *What states and regions have the highest voter percentages in each age group? What about the lowest?*
- *What patterns do you notice using either the graphs or map?*
- *Where do you see similar data by region? Or age group?*
- *What questions do you have when looking at the data this way?*



Explore the Data on CODAP *(20 min)*

1. Remind teams that they should use pattern recognition to explore the data and develop their questions.
2. Encourage them to explore the data to see what they discover. If students hold some assumptions about voting patterns, have them use the data to check their validity.
3. While students are working, check on teams and provide additional support as needed.
4. Ask open-ended questions to guide students in their exploration:
   - *What do you notice about this graph?*
   - *What does this make you wonder?*
   - *What other questions do you have?*
   - *How could you organize this in a different way to help you see patterns? (In a graph, map, table?)*
   - *What other attributes could you compare here?*
   - *What patterns do you see?*

Note: It may be useful to remind students that the numbers they are looking at are percentages rather than raw numbers. This means that a high percentage in one state doesn't necessarily mean that more people voted in that state.

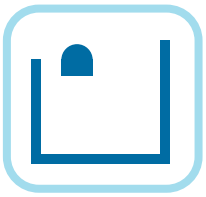
Managing Conversations Around Inequities

The history of voting in the U.S. is closely tied to issues of access. It is natural for an exploration of this topic to lead to discussions of current and historic inequities in voting access. While these can be sensitive issues, we encourage you not to avoid them, but use the data as a way to frame the discussion and even as a launching point for finding solutions.

- Make space for students to ask questions.
- Create a safe space up front so students feel like their voice and opinion matters. Note issues as they arise and fold their concerns into the conversation and the design challenge.
- Have students refer back to the data and facts in front of them.
- Encourage them to consider what additional data might help them get a better picture of the issue. How could they learn more about inequities and access issues?

Craft the Story *(10 min)*

1. After learners have had about 20 minutes to explore, have learners pause even if they haven't been able to find out much information.
2. Remind teams that their next task is to share what they found with others. Review the criteria:

Criteria	• Use **pattern recognition** as you analyze the data.
	• Use **abstraction** to summarize your findings in a Three Slide Story.
	  – Screenshot of Graph/Map (1)
	  – Screenshot of Graph/Map (2)
	  – Question
		 

3. Give teams 10 minutes to draft their Three Slide Story and plan what they will share from their investigation of CODAP.
   - Teams can draft their story using the **Three Slide Story Template** (Slides 16-18).
4. If teams are struggling to decide what to share, ask open-ended question such as:
   - *What were you surprised to learn?*
   - *What are some trends or patterns you noticed?*
   - *What would you want to look at next?*

   Or share an example such as: *"Why is the youth percentage lower than older adults? We want to learn more about why young people aren't voting as much."*

Tell the Story of the Data *(10 min)*

1. Have teams take turns sharing their data stories with the rest of the class. Give each team about one minute to share.
   - Teams should share their Three Slide Story, explaining what they discovered, the questions they still have, and their suggestions of next steps to investigate this area further.
   - If you do not have a way to project from student devices, have learners move around so they can see the images presented on each team's device/computer.
2. Encourage the audience to ask questions and comment on areas where they saw a strong use of data analysis and computational thinking skills.

Debrief *(5 min)*

1. After students share their work with each other, bring the conversation back to the concepts and what they learned.
2. Lead a short debrief, asking questions about the students' data exploration.

   Possible **Debrief Questions** include:

   - *What patterns did you notice in the stories that were shared?*
   - *What types of information did teams focus on in their stories?*
   - *What has this process made you wonder?*
   - *What other types of data would you like to see and investigate?*
   - *How did computational thinking skills (pattern recognition and abstraction) support your data analysis?*
   - *What actions were you or others inspired to take?*
   - *How could data be used to create change?*

Extensions

- **More Attributes:** Students may be interested in investigating attributes such as race, gender, educational attainment, or family income as they relate to voter turnout. Additional data can be downloaded from the U.S. Census Bureau website. See **Voting and Registration in the Election of November 2020**
  - See **For Educators: Teaching with CODAP** for more information about how to upload a CSV or TXT file as a dataset.
  - Teams could also examine **data journalism sites** for more information about voter turnout and the various barriers and motivators to voting.
- **Storytelling:** Have students create a poster, video, or blog post to deepen the story of their data. Use a tool like Canva or Flip to create and share their story online.
- **Code the Story:** To extend the computer science connections, have students use VidCode, Scratch, or another coding tool to tell the story of their data.
- **Interviews and surveys:** The use of data from their own lives can help students make connections and craft a story that is more relevant to themselves and their community. Have students interview people at their school and in their community or conduct an online survey. They can try to find out more about the reasons individuals vote and why they might not vote.
  - It's important to remember that the sample size from local data will not be large enough to identify patterns or make conclusions, but the experience of crafting questions and collecting stories is a valuable part of data science.
  - See **"Why Many Americans Don't Vote,"** a FiveThirtyEight article, for an example of related data journalism.

California Computer Science Standards

Grades	Standard	Description
9-12	9-12S.DA.8	**Use data analysis tools and techniques to identify patterns in data representing complex systems.** (P4.1, P7.1)

Common Core State Standards: Social Science

Grade	Standard	Description
Grade 12	HSS-PoAD.12.6.6	**Analyze trends in voter turnout**; the causes and effects of reapportionment and redistricting, with special attention to spatial districting and the rights of minorities; and the function of the Electoral College.

Next Generation Science Standards

Grades	Standard		Description
9-12	Science & Engineering Practices	SEP-4 (9-12)	**Analyzing and Interpreting Data** • **Analyze data using tools, technologies, and/or models** (e.g., **computational**, mathematical) **in order to make valid and reliable** scientific **claims** or determine an optimal design solution.

Vocabulary

- **Abstraction:** Generalization of a problem — focus on the big picture and what's important
- **Attribute:** The information gathered about each case of data. In this lesson the attributes are information such as Total % Voted or 18-24 (% Voted).
- **Algorithms:** Step-by-step instructions to solve a problem
- **Computational Thinking:** A problem-solving process that can be broadly applied across content areas and everyday life
- **Data:** Information that can be collected, analyzed, and used to inform decisions
- **Data Journalism:** Also known as data-driven journalism, the process of analyzing large data sets for the purpose of creating or elevating a news story
- **Data Literacy:** The ability to interpret, understand, and utilize data. At the heart of data literacy is the ability to identify patterns and discrepancies and draw conclusions.
- **Data Science:** A field in which both humans and automated computers collect, process, analyze, and utilize data to understand and solve problems
- **Data Set:** A collection of data that is related to one topic
- **Decomposition:** Breaking down problems into smaller problems.
- **Pattern Recognition:** Identifying patterns within data to categorize, process and analyze the information.

Analyzing Patterns in Voter Data
Country Voting Case Cards

Print the following case cards on one side and then cut them out for students to use during the lesson.
Each group of students should have one set of 21 cards.

ARGENTINA

Recent Election Year	2021
Voting Age Population Turnout	72.57%
Compulsory Voting	Yes
Sanctions Enforced	Yes

BRAZIL

Recent Election Year	2018
Voting Age Population Turnout	76.83%
Compulsory Voting	Yes
Sanctions Enforced	Yes

AUSTRALIA

Recent Election Year	2019
Voting Age Population Turnout	80.79%
Compulsory Voting	Yes
Sanctions Enforced	Yes

CONGO, DEMOCRATIC REPUBLIC OF

Recent Election Year	2018
Voting Age Population Turnout	41.53%
Compulsory Voting	Yes
Sanctions Enforced	N/A

BELGIUM

Recent Election Year	2019
Voting Age Population Turnout	77.94%
Compulsory Voting	Yes
Sanctions Enforced	Yes

COSTA RICA

Recent Election Year	2018
Voting Age Population Turnout	59.92%
Compulsory Voting	Yes
Sanctions Enforced	No

BOLIVIA

Recent Election Year	2020
Voting Age Population Turnout	87.57%
Compulsory Voting	Yes
Sanctions Enforced	Yes

ECUADOR

Recent Election Year	2021
Voting Age Population Turnout	89.34%
Compulsory Voting	Yes
Sanctions Enforced	Yes

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EGYPT

Recent Election Year	2020
Voting Age Population Turnout	28.82%
Compulsory Voting	Yes
Sanctions Enforced	No

LUXEMBOURG

Recent Election Year	2019
Voting Age Population Turnout	48.64%
Compulsory Voting	Yes
Sanctions Enforced	Yes

GREECE

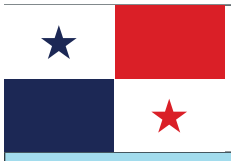
Recent Election Year	2019
Voting Age Population Turnout	65.19%
Compulsory Voting	Yes
Sanctions Enforced	No

MEXICO

Recent Election Year	2021
Voting Age Population Turnout	54.52%
Compulsory Voting	Yes
Sanctions Enforced	No

HONDURAS

Recent Election Year	2021
Voting Age Population Turnout	59.72%
Compulsory Voting	Yes
Sanctions Enforced	No



PANAMA

Recent Election Year	2019
Voting Age Population Turnout	75.66%
Compulsory Voting	Yes
Sanctions Enforced	No

LEBANON

Recent Election Year	2018
Voting Age Population Turnout	42.45%
Compulsory Voting	Yes
Sanctions Enforced	N/A

PARAGUAY

Recent Election Year	2018
Voting Age Population Turnout	52.36%
Compulsory Voting	Yes
Sanctions Enforced	No

Analyzing Patterns in Voter Data
Country Voting Case Cards

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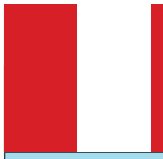


PERU

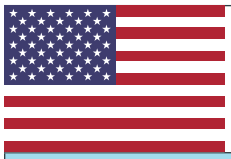
Recent Election Year	2021
Voting Age Population Turnout	83.63%
Compulsory Voting	Yes
Sanctions Enforced	Yes

URUGUAY

Recent Election Year	2019
Voting Age Population Turnout	94.88%
Compulsory Voting	Yes
Sanctions Enforced	Yes

SINGAPORE

Recent Election Year	2020
Voting Age Population Turnout	51.37%
Compulsory Voting	Yes
Sanctions Enforced	Yes



UNITED STATES OF AMERICA

Recent Election Year	2020
Voting Age Population Turnout	62.36%
Compulsory Voting	No
Sanctions Enforced	N/A

THAILAND

Recent Election Year	2019
Voting Age Population Turnout	69.75%
Compulsory Voting	Yes
Sanctions Enforced	No