What Your Colleagues Are Saying . . .

"*Data Minds* is an absolute masterpiece. It is the first book I've read that effectively puts the tools of teaching data skills into the hands of teachers. This book should be required reading for everyone involved in K–12 education."

Steve Levitt
Co-author of *Freakonomics*
Chicago, IL

"*Data Minds* is a breath of fresh air for the mathematics community. In this publication, Boaler and Williams provide teachers with a blueprint on how to infuse data literacy in the mathematics classroom. I especially love the emphasis on helping students become 'question askers.' This mindset will go a long way toward helping all students become connoisseurs of data."

Latrenda Knighten
President (2024–2026), NCTM
Baton Rouge, LA

"In the postfactual world where the distinction between opinions and facts are blurred, it is more important than ever that our students become data literate. This book shows us how to do this—not through massive revisions to curriculum, but through small changes we can make in our teaching. Through real classroom examples, Jo Boaler and Cathy Williams show us how to easily tap into students' natural curiosity about information to effectively build the data literate students our world needs."

Peter Liljedahl
Professor, Simon Fraser University
Author, *Building Thinking Classrooms*
Vancouver, British Columbia, Canada

"I love *Data Minds*' call to educators to 'teach with a data flair!' Through a range of interesting examples, Boaler and Williams illustrate how teachers' choices deeply shape students' learning experiences."

Pam Harris
Author, *Developing Mathematical Reasoning*
Founder, Math Is Figure-Out-Able
Austin, TX

"Jo Boaler and Cathy Willams are at it again—dropping another banger for math educators! This book makes data cool, relevant, and totally accessible. From real-world investigations to cross-curricular magic, Jo and Cathy show us how to turn data into a powerful tool for student curiosity and critical thinking. It's the resource you didn't know you were missing—but won't want to teach without."

Vanessa "The Math Guru" Vakharia
Author, *Math Therapy*™
Host, The Math Therapy Podcast
Toronto, Ontario, Canada

"As the world becomes increasingly data-driven, it is vital that students have opportunities to become data literate. Boaler and Williams provide an outstanding resource for educators to create such opportunities. Walking readers through the data learning cycle deepens understanding, providing professional development to implement data literacy. The data teaching moves throughout the book are fantastic and provide concrete steps all educators can take in creating opportunities for students to learn."

Kevin Dykema
Mathematics Educator
President (2022–2024), NCTM
Mattawan, MI

"I absolutely love what Jo Boaler and Cathy Williams have done in *Data Minds*! This book is a breath of fresh air for teachers who want to make learning exciting and rooted in the real world, without adding more content. It shows how students can get curious, ask BIG questions, and use data to understand the world around them (and even make it better!). The stories in here are inspiring and full of heart! If you've ever wondered how to bring data to life in your classroom, this book is your new best friend!"

Talithia Williams
Professor of Mathematics, Harvey Mudd College
Host, PBS *NOVA*
Author, *Power in Numbers*
Claremont, CA

"*Data Minds* is a must-read, whether you're new to teaching with data or looking to go deeper. Full of actionable teacher moves and grounded in rich, real-world classroom examples from around the globe, it connects math with other content areas across grade levels and helps teachers support students in developing critical data-thinking skills in an era flooded with misinformation."

Kristin Hunter-Thomson
Director & Founder, Dataspire Education & Evaluation LLC
Santa Cruz, CA

In *Data Minds*, Jo Boaler and Cathy Williams don't just tell, they *show* us the importance of interrogating the data we ingest every day in dizzying quantities. Through classroom case studies and data teaching moves, the authors model an inquiry pedagogy that fosters data literacy among educators and learners. With the rise of misinformation, this call to critical consciousness around the role of data in teaching and society could not be more timely.

Shane Safir
Author, *Street Data*
Coach, Facilitator,
Listening and Leading for Equity
Oakland, CA

We dedicate this book to the teachers and students who shared their data journeys with us—thank you. We also dedicate it to the future data explorers of the world.

For Ryker—May your learning journey be filled with data, guided by curiosity, enriched with discovery, and open to endless possibilities.

DATA MINDS

How Today's Teachers Can Prepare Students for Tomorrow's World

Jo Boaler • Cathy Williams

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Contents

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Web content may also be accessed via the URLs that accompany each QR code.

How to Read This Book

Data Minds shares ways that teachers can become data empowered—not by adding new content to teach (because we know you're busy!) but by teaching with a *data flair*. As inspiration, we traveled around the United States and the world to capture the work of teachers who are beginning to teach with data, knowing that other educators will learn from their important work and the deep student engagement it brought about. In the chapters that follow we highlight several of these cases.

Throughout the book we focus on several *data habits of mind* that are needed as students work with data. We do this because we know that effective learners are not just students who acquire more knowledge; they are students who are curious and intrinsically motivated to learn; they are students who engage with agency, using their own ideas in the learning process, and who seek patterns in the world, always looking beyond what is obvious to uncover relationships and connections. These data habits of mind, which can be cultivated through data studies and data investigations, help students develop into effective learners.

We start the book in Chapter 1 considering why we should care about data, setting out the importance of students developing data literacy—an ability and willingness to read and understand data in the world. The book is not about the provision of a data science course in high school but about the development of an important form of literacy that extends across the grades. We are excited to share the ways teachers can bring a data flair to their teaching, because we know that students are excited to learn about data and to develop *data minds*.

Across the book we have highlighted a data cycle, which starts with asking a question. When students ask data questions and conduct investigations, they are working to explain some of the variability in the world. In Chapter 2 we focus on the asking of questions, sharing a case of young students asking questions of their lives and moving to a discussion of important types of questions, including protective questions, questioning what

data might be missing, and consideration of correlation and causation. In Chapter 3 we move to the next part of the data cycle—looking for patterns in data. This is the stage in which students conduct analyses, and we share an example of analytical work conducted by students in an AP history class, helped by their teacher who encouraged them to consider more variables. We also consider pattern seeking to help understand seal behavior with CODAP software and the protection of rhinos with some engaging lessons developed in Scotland, as well as a model we have really appreciated for encouraging skepticism in the classroom.

In Chapter 4 we share many different forms of data representations, including visuals, sculptures, basketball videos, sounds, and maps. This is the true multi-modal nature of data, which can be communicated in a variety of ways. We hope these examples will inspire teachers to consider and create data captured in these and other forms. In Chapter 5 we move to the ways that students can ask data questions and conduct data analyses that might help the world, starting with a lovely example of students in London collecting data to help a local community kitchen that provides food to low-income and homeless people in the city. The students felt empowered by the project, knowing that they could make a difference in the lives of people in their community. A second school project we share in this chapter involves middle school students considering penguin extinction in South Africa and a third from a Citizen Science project that resulted in high school students helping create safer routes to school. We finish the chapter with the example of second-grade students learning about sea turtles. These are just four examples; schools can encourage discussions of data questions that may help their own school community, and the possibilities are endless.

Chapter 6 revisits our fourth graders learning about data with an engaging library investigation—itself an example of how data investigations can help a school. The chapter also shares many different data moves that can encourage the development of students' *data minds*.

Habits of Mind

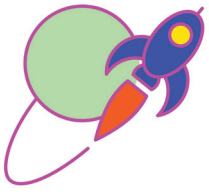
Throughout look for these icons to indicate habits of mind:

Questioning:

Curiosity and Skepticism:

Attending to Fairness:

Investigating and Pattern Seeking:



Communicating in Multi-Modal Ways:

Resources

We have developed many online resources to help educators develop students' data minds; we share these on www.youcubed.org; the vast majority of them are freely available.

Here are some highlights:

- **Data Talks!** We feature these in Chapter 4 of the book, but you can see the full offering here: https://www.youcubed.org/resource/data-talks/
- **Data Big Ideas and Tasks.** This page maps out the content of data literacy across the grades, with suggestions for tasks: https://www.youcubed.org/data-big-ideas/

- **Grade 6-10 Data Lessons.**
  https://www.youcubed.org/data-science-lessons/
- Our free one-year high school course in data science that can be taken as a whole class or as single units:
  https://hsdatascience.youcubed.org/
- Professional development in data literacy:
  https://www.youcubed.org/professional-development-at-stanford/
- A low-cost online course:
  https://www.youcubed.org/21st-century-teaching-and-learning/
- More in-depth professional learning opportunities:
  https://www.youcubed.org/professional-development-at-stanford/

We hope you enjoy the book and that it helps you become data empowered!

—Jo and Cathy

Acknowledgments

We would like to express our sincere gratitude to the teachers who graciously opened their classrooms to us and contributed to the content of this book. Your generosity and insights were invaluable. We also extend our thanks to all the readers who joined us on this journey, exploring new approaches to education.

Our heartfelt thanks go to the following teachers (in order of appearance):

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- Kaedan Peters
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- Nova Katz
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- Joseph Centoni
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- Gina Rossi
- Melissa Bowdoin
- Nicki Edelman

A special thank you to their students also, whose enthusiasm and engagement made all the difference.

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As always, we extend our heartfelt appreciation to our youcubed team—Jessica Method, Kristina Dance, Jack Dieckmann, and Estelle Woodbury—for their unwavering support and dedication.

And last but certainly not least, we thank our wonderful editor, Debbie Hardin. It was Debbie's idea for us to write this book, and she provided incredible support and enthusiasm at every stage of the book-writing process, even traveling to Eugene, Oregon, with us to learn about penguins! We could not have asked for a more caring editor.

About the Authors

Dr. Jo Boaler is the Nomellini Olivier Professor of Education at Stanford University. Previously she has served as the Marie Curie Professor of Mathematics Education in England and a maths teacher in London comprehensive schools. Her PhD won the national award for educational research in the United Kingdom. She is an elected fellow of the Royal Society of Arts (Great Britain) and a former president of the International Organization for Women and Mathematics Education (IOWME). She is the recipient of a National Science Foundation Early Career Award, the NCSM Kay Gilliland Equity Award (2014), and the CMC Walter Denham Mathematics Leadership award (2015). She is an elected fellow of the Royal Society of Arts (fRSA) and a White House presenter on women and girls. She co-founded www.youcubed.org, a free website that gives teachers, parents, and students the resources and ideas they need to inspire and excite students about mathematics. She is the author of 20 books and numerous research articles; her work has been published in the *New York Times, TIME* magazine, *The Telegraph, The Atlantic, The Wall Street Journal*, and many other news outlets. She was one of the writing team for the 2023 California Mathematics Framework, is co-leading a K–12 Data Science Initiative, and was named as one of the eight educators "changing the face of education" by the BBC.

Cathy Williams is a passionate mathematics educator, author, and advocate for innovative teaching. With more than 18 years as a high school mathematics teacher and AVID coordinator, followed by a decade as a mathematics administrator in San Diego County, Cathy has dedicated her career to transforming how students and teachers engage with mathematics. As the co-founder and executive director of youcubed at Stanford University, Cathy has played a pivotal role in developing research-based curricula, coaching educators, and delivering professional development worldwide. Her work fosters mathematical mindsets, visual learning, and deep conceptual understanding. Cathy is an advisor to mathematics education technology start-ups and a widely recognized speaker.

Why Our Students Need Data Minds

1

It was the eve of one of the most significant events in recent history. The group of us gathered at Stanford University, nervously bumping our elbows in greeting instead of hand shaking, did not know the significance of the days that lay ahead. We were one of the last meetings to take place at the university before it officially closed its doors for the duration of the "social distancing" time. It was March 2020, and much conversation and news was focused on data—particularly the data surrounding the spread of the virus that later became known as COVID-19. But for the group of us there that day, we were focused on data more generally and the role it could play in educating students, empowering them to make sense of and tackle important issues in their lives. Our group included thought leaders in education, mathematics, statistics, data science, and technology, some of whom had flown in from other countries. We all knew that helping students become data literate would protect them from the world of misinformation lying in wait for them and help them make informed decisions to improve their own lives and those of others in their communities.

One question that took up much of the group discussion was how teachers can add content to their already full plates. We recognized that a part of **data literacy** is mathematical, but we also knew that understanding, reading, and communicating about data involves many important parts of the curriculum, including the humanities and arts, and knowledge that draws from science, history, sports, geography, and more. Data literacy is a truly cross-curricular goal that makes it perfect for teaching in the elementary years and shines a spotlight on the limits of subject boundaries. In the years since that meeting, we have met many wonderful teachers who are not adding content to their already full schedules but instead are teaching the content they have always taught, with a **data flair**. The teachers come from elementary, middle, and high schools, with some middle and high school teachers collaborating across subjects to engage

Data literacy: used to describe whether a person can read, understand, utilize, and communicate data in different ways.

Data flair: describes a teacher incorporating data into their typical lessons.

students in data investigations across the school. At the heart of these teachers' work is their understanding that when they teach their usual subjects with data the ideas come alive.

Data Minds

Taking a data perspective does not need to mean big shifts for us as teachers—it can be as simple as a decimal number describing a plant's height in the classroom, or a science investigation of whales including data on their sounds in the ocean, or an art project creating beautiful data visuals of students' pet behavior (Figure 1.1). We will share ideas like this for incorporating data in all subjects throughout the book. Helping students become data literate is an important goal for every educator, especially as we are living in a world increasingly full of misinformation created to mislead. This book is intended to help you, teaching any subject or any grade, bring a data flair to your teaching, helping students to develop **data minds** and navigate the data-filled world in which they live.

Data minds: describes an openness toward data, a curiosity about data in the world, and the willingness to record, study, and reflect upon data.

FIGURE 1.1 Whales Are Among Nearly Limitless Possibilities of Subjects for Data Analysis

Source: istock.com/Jonas Gruhlke

In this book we describe the teaching goal of developing data literacy as one that means encouraging *data minds* because those who are comfortable working with data usually exhibit certain *habits of mind* (H. Lee et al., 2022). We are particularly highlighting five ways of approaching knowledge that we will return to as we discuss the different teaching cases. As students learn to approach knowledge with these habits of mind, they will be helped not only in their development of data literacy but also in their learning of all subjects and even in their approach to life. The five habits of mind position students actively, giving them a role in seeking and investigating knowledge deeply.

GOVERNMENT DATASETS

https://qrs.ly/eygncio

To read a QR code, you must have a smartphone or tablet with a camera. We recommend that you download a QR code reader app that is made specifically for your phone or tablet brand

Data in the World

Our world has changed in a few dramatic ways over recent years, one being the immense wave of data that has crashed down upon all our shores. Since 2009 (the Obama era), the federal government of the United States has been working to make datasets freely available.

It is hard to watch TV or read news or sports sites without being presented with interesting data and **data visualizations**. People in a multitude of jobs and life circumstances have found data, coupled with the power of new technological tools, to be so helpful that by the end of 2020 we, as a society, had generated ten times as many bits of data as there are stars in the universe (Messy Data Coalition, 2020). And the proliferation of data continues—every few years the volume of data across the world doubles in size! Jobs abound for those who have developed the ability to investigate data, and data analysts are in high demand. But you don't have to be a specialist to benefit from data literacy: Almost every employee—every *human*—will be more helpful and effective if they are comfortable working with data.

Data visualization: a visual representation of data.

By the end of 2020 we, as a society, had generated ten times as many bits of data as there are stars in the universe.

Data comfort and data literacy not only help people in work but also in all aspects of their lives. Everybody needs to look after money, for example, and these days a true understanding of health requires an understanding of data. Many of us carry fitness devices that give us continuous data on our workouts and movement. The graphs that filled our TV screens during the pandemic, and the spread of misinformation about vaccines, underscored the need for a data literate population.

Data literacy is not, as some might think, about teaching students statistics—statistics are a part of data literacy, but there is so much more, including the development of inquiring, curious minds. The journey to become data literate should start in pre-kindergarten and develop across

GAISE REPORTS
https://qrs.ly/logncip

the grades, with students coming to know data—of different forms, whether they be numbers, colors, feelings, or soft toys—asking questions, developing curiosity, and communicating their findings. The Gaise Reports, authored by professional statisticians, emphasize the importance of data literacy extending across all grades and contain a wealth of ideas for lessons and teaching moves. These are aspects of teaching and learning that all teachers can learn to do, and that can become a highlight of anyone's classroom day.

Data Literacy and Creativity

GEORGE LAND VIDEO ON CREATIVITY IN STUDENTS
https://qrs.ly/m5gncoc

The opportunity to develop curious data minds is one of the most valuable aspects of data literacy, and one that our school system desperately needs. Many of us are aware that the school system's current focus on disconnected standards and standardized tests is the enemy of creative thinking, and teachers need all the help we can get, to keep nurturing creativity in students. George Land, was an author, speaker, consultant, and general systems scientist and an advocate for creative thinking. During his time developing methods to help organizations develop innovation and creativity, he and Beth Jarman, a leading educator, were approached by NASA and asked if they could develop a test for their staff that would show which of their staff were most creative and could be put on the top teams. The test they developed was found to be very predictive of employees' success in work. The test asked people to find different uses for well-known objects (such as forks) and solve problems in new ways. After developing the test for NASA, Land and Jarman decided to give it to four- and five-year-olds. They were stunned to find that 98% of the young children scored in their "genius" category on creativity. This prompted them to follow the children over time and give the same students the test again five years later. By the time the students were 10, the proportion classed as highly creative had fallen to 36%; at age 15, the proportion fell to 12%. When they gave the same test to hundreds of thousands of adults, only 2% of them showed creativity (Land & Jarman, 1992; TEDx Talks, 2011). Many analysts lament the fact that students are rarely encouraged to use creativity in schools, but recent research is showing that when people engage in curiosity, their brains come alive with activity as the brain engages in a "complex dance between the frontal lobes and the default network" (Create Potential, 2025, Section "The Brain's Electric Dance," para. 1; also Beaty et al., 2014). Others have pointed out that when we encourage students to be curious, it protects them from adversity in life, as the brain becomes more able to adapt when people face situations that cause emotional or cognitive distress (B. Lee & Lee, 2016; Metzl & Morrell, 2008).

Curiosity is often discussed and valued by designers, artists, and education visionaries; it is less typically highlighted, but just as important, in science and mathematics, and data investigations bring this to light beautifully. Any scientist or mathematician starts with a question she is curious about and then collects data or develops reasoning to investigate it. When we invite students to become data literate, we should encourage them to come up with their own questions that they are curious about. Later chapters will develop the ways we as teachers can encourage students to cultivate a curious, question-asking mindset. What is clear is that we cannot leave the important role of creating data-literate students solely to teachers of mathematics. The responsibility—and the opportunity—extends to all of us working in education, across disciplines and across grades.

When we invite students to become data literate, we should encourage them to come up with their own questions that they are curious about.

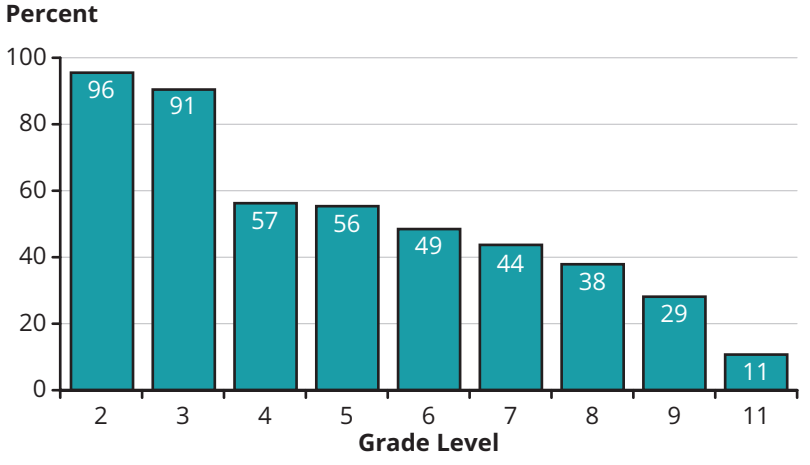
Equitable Opportunities

There are many ways in which giving students opportunities to become data literate could contribute to the creation of more equitable opportunities for students. Achievement in our school system is sadly often predictable by students' race, gender, and socioeconomic status, and all the myriad ways privilege and oppression intersect (Crenshaw, 2015; Tate, 1997). The proliferation of online and other resources available to homes with resources only serves to widen long-standing equity gaps. This is why we are committed to providing ideas and resources that can be used inside schools. As our classrooms teach students to become data inquirers, we will also help students become critical thinkers who are able to read and understand the world. As students become data empowered, they will be in a better position to advocate for themselves and to make real change in their lives and in the lives of their communities.

Just as we are aware that our world is being filled with data, we are also aware that our students are not developing the knowledge they need to make sense of data (Mendez-Padilla, 2025). Studies have found that students often cannot determine the validity of data presented to them, whether scientific (Zucker et al., 2020) or political (Kahne & Bowyer, 2017), and they are unable to detect bias in online sources (Wineburg et al., 2016). Even the statistical knowledge that is part of data literacy is not being taught in many schools. There is not a great deal of emphasis on statistics in the U.S. mathematics standards, but even the statistics that are mentioned are not being well learned, as the graph in

Figure 1.2 shows, with a clear decline in students' statistical proficiency as they move through the grades.

FIGURE 1.2 Percentage of California Students Meeting Standards in Statistics or Data at Different Grade Levels



Students from 21 school districts in California meeting data or statistics standards assessed through MARS assessments (n = 14,574).

Source: Data from Silicon Valley Mathematics Initiative's Mathematics Assessment Collaborative: Mathematics Assessment Service (MARS) and California Assessment of Student Performance and Progress (CAASPP) Technical Report by Educational Data Systems, 2018.

A postfactual world: a world where the truth, honesty, and facts take a back seat to opinions, and misrepresentations are deliberately shared to mislead and manipulate people.

The lack of attention paid to statistics and data literacy more generally is a serious equity issue that threatens not only the education of individual students but also the preservation of our democratic society, because it leaves students vulnerable to those who want to mislead them. The spread of misinformation in the world, whether it is contributing to faulty election results, or the "canceling" of people, or resistance to scientific fact (Furnham & Robinson, 2022; Lukianoff, & Schlott, 2023; Micich & Cross, 2023), is accelerating worldwide. It is critical we empower young people to resist this **postfactual world** and help examine any data results presented to them with a critical lens so they can separate fact from fiction and propaganda.

It is critical we empower young people to resist this postfactual world and help them examine any data results presented to them with a critical lens so that they can separate fact from fiction and propaganda.

Neglecting data literacy also means denying students the opportunities to learn with the accessible and often free data tools that could help them in

their lives. This was brought home to us recently when we were interviewing a group of students who had taken the high school data science course we have made freely available on our Stanford site: youcubed.org. We asked the students what they thought about the class, and one of the seniors immediately shared that he was working in a theater as a lighting designer after school and could now do calculations with Excel sheets in 30 seconds that, prior to the course, had taken him 45 minutes to do by hand. Later he shared with us that despite being a senior in high school, he had never been introduced to spreadsheets before. This may seem shocking, but it is not unusual.

STUDENT OPINION ON DATA SCIENCE COURSE

https://qrs.ly/rdgnciq

Learning for Life

Elliot Eisner was a Stanford professor, best-selling writer, and champion of the arts in education. He shared many important insights about education and learning, one of them being a statement that should be obvious but somehow gets lost in educational policy making. He pointed out that the function of schooling is not to enable students to do better in school. The function of schooling is to enable students to do better in life (Eisner, 2003). This realization should play a much bigger role in educational policy and planning than it does now, as it is clear to many of us that much of the content taught in schools, and valued by college admissions, is there to preserve traditions, rather than to prepare students for their lives and their ever-changing futures. Data science, as a high school course, has the potential to disrupt long-standing inequities in mathematics pathways and focus on the content students need in their lives, two reasons that it seems to be a controversial proposition for some. The course has been challenged by some traditionalists, even as, or perhaps because, it diversifies the students going forward in STEM (Boaler et al., 2024).

"The function of schooling is not to enable students to do better in school. The function of schooling is to enable students to do better in life."

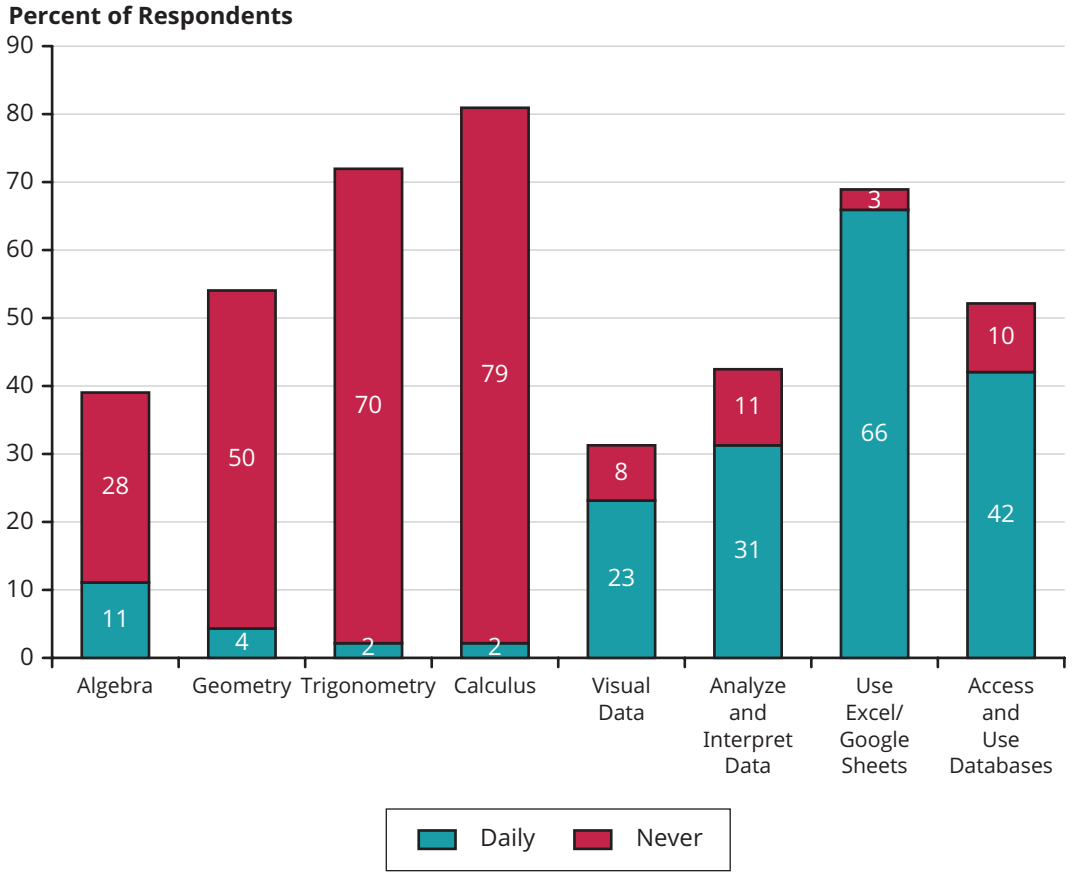
—Elliot Eisner

Data science, as a high school course, has the potential to disrupt long-standing inequities in mathematics pathways and focus on the content students need in their lives, two reasons that it seems to be a controversial proposition for some.

Steve Levitt, an economics professor at the University of Chicago, and author of the famous *Freakonomics* book series (e.g., Levitt & Dubner, 2005, 2020), became interested in the mathematics his high school children were learning in school when he helped them with homework. He noticed a huge disconnect between the mathematics they were learning

and the mathematics he used as a professional economist (Boaler & Levitt, 2019; Freakonomics, 2019). He recognized the mathematics they were learning as the same content he learned in school. Steve's interest in students' mathematics pathways led him to us; he also attended the March 2020 meeting that opened this chapter. His team at the Freakonomics website posted a survey on their site. The survey asked what mathematics people used in their lives. The results are shown in Figure 1.3.

FIGURE 1.3 Freakonomics Results: How Often Do You Use This Mathematics in Your Life?

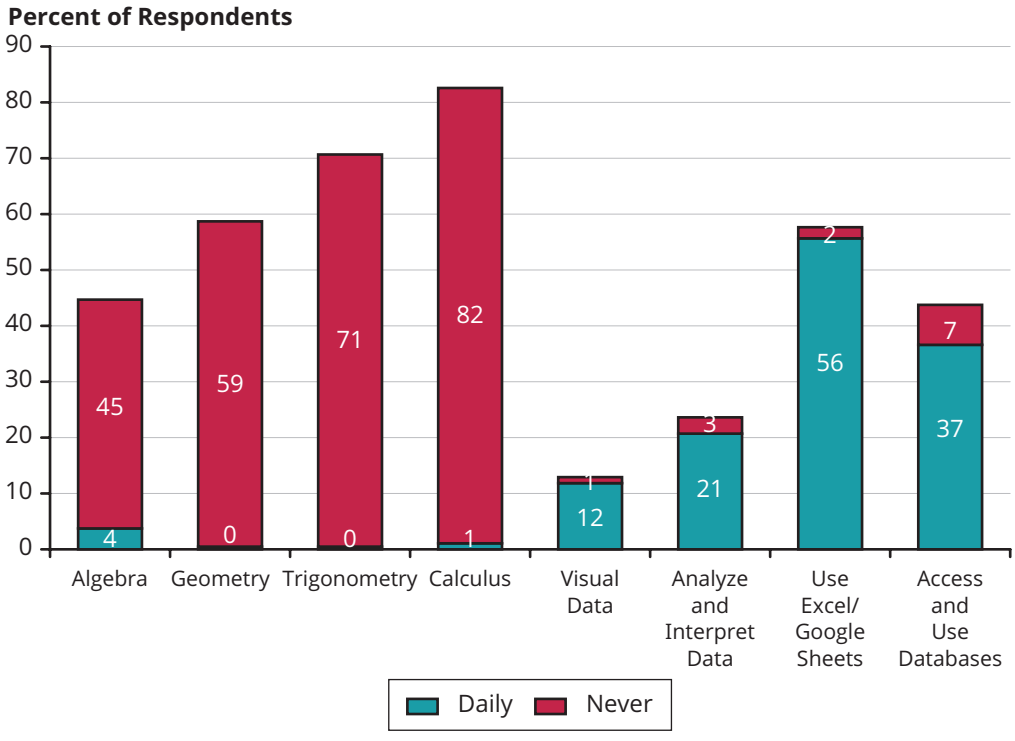


Source: youcubed.org.

FREAKONOMICS WEBSITE
https://qrs.ly/z5gncir

The Freakonomics team was worried that their data was skewed toward men and economists, who are the ones who populate the website in higher numbers, so we gave the same survey to more than 1,000 educators at a conference for leaders. These results are shown in Figure 1.4.

FIGURE 1.4 Educators Results: How Often Do You Use This Mathematics in Your Life?



Source: youcubed.org.

It may be that people use algebra, geometry, trigonometry, and calculus more than they think, but whether this is true or not, the surveys clearly show that people in the modern world need to visualize, analyze, and interpret data and use spreadsheets and databases frequently. However, these are competencies that are not typically taught or even encouraged in U.S. schools.

Summary

We know that teaching students to be data aware helps young people navigate their worlds, which is important enough, but it does something else, just as important, and often extremely difficult for us as educators—it helps students develop into *the kinds of learners* that will help them throughout their studies and their lives. Effective learners are curious and intrinsically motivated to learn, they engage with agency, using their own ideas in the learning process, and they seek patterns in the world, always looking beyond what is obvious to uncover relationships and connections. These are the

skills required to be lifelong learners, which is increasingly necessary in ever-evolving career pathways and in our data-filled lives. They are also the skills that are taught as students take part in data investigations, as the rest of the book will highlight.

Reflection Questions

1. How do you use data in your life?
2. Reflect on the statement "The function of schooling is not to enable students to do better in school. The function of schooling is to enable students to do better in life."
3. We and Freakonomics asked people what mathematics they used in their lives. Were you surprised by the results? Did the results reflect your own experience?