Why aren’t schools teaching data science?

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Emily Warrender September 22, 2025

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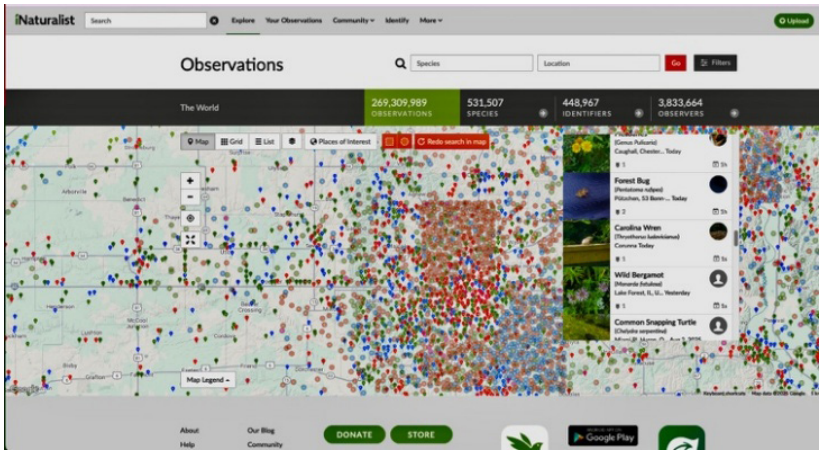
Nancy Butler Songer highlights the importance of data literacy skills for pre-university students. The Life Right Here and Everywhere Project aims to equip youth with essential data science skills, fostering confidence and addressing challenges in integrating data into lessons

Data are everywhere. Whether we are in the United States using a navigation app to get driving directions or warn us about road closures, or in India, where online stores like Flipkart use shopping data to recommend books, clothing, and electronics, our world presents us with near-constant situations, both personal and professional, mediated by data. “This situation presents both ‘perils and promises,’ said Rob Gould (NASEM, 2023). “The peril is that ignorance of data is harmful to individuals and society. The promise is that even a small amount of knowledge about how to make sense of data and how to communicate about them can be ‘tremendously empowering.’… At this point, we are a long way from building [data knowledge] successfully and at the level that we require.” (NASEM, 2023; p.8).

CyberTracker Zone Summary Animal Name	Zone A	Zone C	Zone E	Micro Habitat	Total
Earthworms	2	0	2	- In dirt	4
Ants	2	229	75	- On something hard - On grass	306
Other insects	0	0	2	- On grass - Other microhabitat	2
Unknown beetle	0	3	0	- On plant	3
Unknown insect	0	2	0	- On dirt	2
Other leggy inverteb	1	0	0	- In dirt	1
American robin	6	1	3	- On tree - In the sky	10
Black tern	200	0	0	- On plant - On something hard	200
House sparrow	0	0	1	- On tree	1
Mourning dove	3	0	0	- On tree	3
Unknown bird	7	5	2	- On tree - In the sky	14
other birds	0	1	2	- In water - On grass	3
E. fox squirrel	1	1	0	- On something hard	2
Human	10	21	1	- On grass - On something hard - Other microhabitat	32
Other mammal	3	0	16	- Other microhabitat - On something hard	19
Red squirrel	2	0	0	- On tree	2
Number of Animals (Abundance)	237	263	104		604
Number of Kinds of Animals (Richness)	11	8	9		16

Pre-university students need a range of experiences working with data across various topics and contexts, including mathematics, science, languages, and the arts. Multiple and varied data-rich experiences help students, even in the elementary grades, to see data science as relevant to their lives. Rich data experiences also help challenge stereotypes, such as the notion that only ‘math people’ can find value or need to work with data.



Data analysis within the Life Right Here and Everywhere Project

Our National Science Foundation-funded research and development projects focus on creating and evaluating six-week curricular units where students aged 8-13 gather and analyze data on local insects, design physical traps, and develop other solutions to increase indigenous insect populations within local settings. Students collect their own field-based data and/or use data from iNaturalist to generate a summary of the count (species abundance) and number of different species (species richness) to estimate the biodiversity of insects that live in their area. The unit helps students to gain a deep understanding of the Next Generation Science Standard (NGSS Lead States, 2013) MS-

LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. The curricular unit culminates in students' design and evaluation of a trap to mitigate populations of harmful invasive insects. This section addressed the science standard, MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

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We conducted several research studies to provide evidence of student learning through data collection and analysis. In a series of studies spanning three years, students demonstrated significant improvement on test items that measured the construction of scientific arguments based on their data analysis. In addition, after we introduced a more systematic critique of each other's data and trap designs, students made statistically significant improvements in data critique and design (for more information, see Songer, Calabrese, Cordner, & Aina, 2024).

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Our work also revealed two challenges with incorporating more data into these science lessons. First, there is not always a straightforward way to evaluate or assess the quality of data collection and analysis, particularly when the data are collected asynchronously. In our program, we developed coding rubrics and grading systems to evaluate both online and offline student artifacts. Second, many professional data sets are not user- friendly for regular people, or the interface precludes real-world use. Our solution was to utilize students' own or already user-friendly data, such as that available through iNaturalist. However, we also encourage individuals to ask data providers if they can provide a 'strategically simplified' section of the data for the focal audience. Ideally, this simplified version of the data preserves the quality while avoiding the introduction of additional misconceptions or errors.

It is our responsibility to provide rich learning opportunities in data science, empowering youth to make sense of the data-rich world in which we live. We encourage others to integrate data science into a range of activities, so that our youth will develop a comfort with data science and a sense of agency necessary for them as critical consumers and decision-makers.

References

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Project

Life Right Here and Everywhere

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