



Integrating Data Inquiry with Social Studies Learning in Middle School

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Partnership between TERC and Boston University



The Civic Data Project

Social studies teachers focus on inquiry, sourcing, contextualization, and corroboration making the classroom a rich environment to practice data literacy. The Civic Data project helps teachers create opportunities for their students to engage with civic data and find ways to connect data to community action. Working collaboratively, we are developing data-rich resources and activities for the social studies classroom that help students:

- deepen data literacy
- use civic data to explore their own questions
- connect data to issues that have meaning and relevance for their communities

The Model

The project uses an interdisciplinary co-design approach to develop lessons that engage students in data inquiry.

- **Our team of teachers:** 3 middle school social studies teachers paired with 2 math teachers (grades 6, 7, and 8)
- **Content areas:** each teacher works with a different curriculum and subject matter (global studies, ethnic studies, civics)
- **Location:** communities in MA and RI

The collaboration between teachers and researchers keeps the work responsive to the learning context and the students' communities, and forges connections so that we can learn from each other. The interdisciplinary lens of social studies brings interrogation, contextualization, and empowerment to act on data into focus.

In 2024, the **Civic Data Summer Workshop** brought together a team of teachers and researchers to explore free, easy-to-use tools and resources that students can use to interact with civic data. The team

- engaged with activities, tools, and platforms as *learners*
- reflected on the activities as *educators*
- worked collaboratively with the project team to *design* a lesson sequence using data inquiry

This experience launched the **learn, reflect, design, and develop** phase of the work. We are now further refining the curriculum and beginning classroom implementation.

Methods

Data from this early phase of our project includes video of teacher's final presentations and field notes from a weeklong workshop. Changes to the lesson arcs as activities evolve are documented and tracked. Data from the design and development process are analyzed using qualitative methods (Saldana, 2016) focused on uncovering themes that emerge as we negotiate the development process and plan classroom implementations. In the next phase the researchers will conduct classroom observations and teacher focus groups to see how the curriculum implementation worked.

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Findings: Defining Learning Goals

Our interdisciplinary co-design process has been refining how we conceptualize data inquiry situated within the discipline of social studies in the middle school years. Data science concepts and practices need to be integrated in an accessible way, playing a supportive role in deepening social studies learning.

Tool for exploring data inquiry in the middle school classroom

- **Step 1: Evaluate** the origin of the data

Ask: Who, What, When, Where, How, Why

- **Step 2: Examine** the structure of the data

Ask: Who or what does the data tell us about? What attributes (variables) are included? What units of measurement were used? What scales are shown and are they appropriate? What does each element of the data visualization tell you?

- **Step 3: Explore** the messages in the data

Ask: What question(s) was the author trying to explore? (how the data are distributed; group comparisons; relationship between variables; change over time or space; likelihoods). What is the author trying to communicate?

- **Step 4: Learn** the data

Ask: What patterns do I see? What can I learn from this data? What arguments or claims do the data support? What new questions are inspired by the data?

- **Step 5: Connect** and contextualize the data

Ask: How can my knowledge of history, geography, or politics help me understand patterns I see in the data? How might this data be relevant to current events? What personal connections can I make with this data? Why should we care about this data?

1. Evaluate

2. Examine

3. Explore

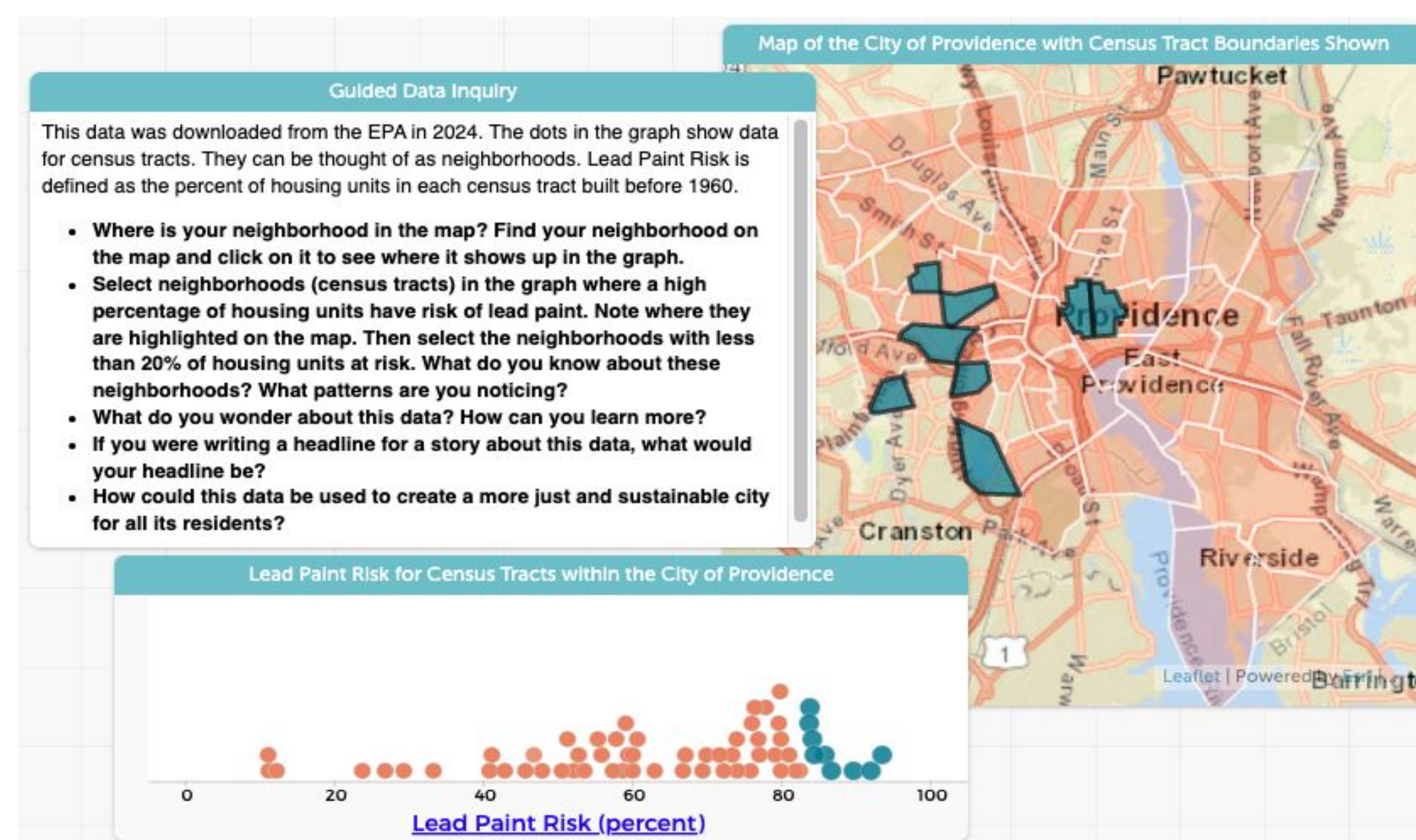
4. Learn

5. Connect



Example from a Data Inquiry Sequence for Providence, RI

This 7th grade lesson engages students in a study of local data following a unit on industrialization and human rights. The dataset includes measures of air quality, lead paint risk, and exposure to hazardous waste, as well as demographic variables identifying vulnerable populations. Below is an example scaffolding to support the Learn and Connect phase of student engagement with this data.



References

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