Geography and Civics in Action

Studying Zoning and Built Environment with WebGIS

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San Diego, CA
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(Before we begin; will be repeated at end)

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- Presentation available upon request

- If you want to see any of the curricular materials from this project, visit https://eli.lehigh.edu/semi
(Quick refresh on project context)

Socio-Environmental Science Investigations (SESI -- see [https://eli.lehigh.edu/sesi](https://eli.lehigh.edu/sesi))

- Cross-curricular: 9th grade science and social studies, runs consecutively
- Sequence of authentic local geospatial investigations, student data collection throughout
- Projects for students to demonstrate spatial thinking, tool mastery

NSF ITEST grant, 2016-19. Grant team included

- Education researchers (science ed, social studies ed, STEM ed) + doc students
- Earth & Environmental Science faculty, Political Science faculty + doc student
- Social studies & science teachers from Building 21 High School

Setting

- School = Public, urban, competency-based, graduated first class this June
- Students = 2/3 Hispanic or Latinx, 21% ELL, 19% have IEPs, many (~10-20%) categorized as unengaged learners
Examining the mix of science & social studies

Investigation topics (can be flexibly sequenced):
● Observing: Ecology, built environment
● Trees & ecological services
● Urban Heat Islands
● Zoning
● Built Environment activity
● Transportation
● Carbon sequestration lab

Project topics
● Tree planting
● Culminating project (urban planning for social, environmental, & economic sustainability)
Examining the mix of science & social studies

Investigation topics (can be flexibly sequenced):
- Observing: Ecology, built environment (sci & SS)
- Trees & ecological services (sci & SS)
- Urban Heat Islands (sci)
- Zoning (SS)
- Built Environment activity (SS)
- Transportation (sci & SS)
- Carbon sequestration lab (sci)

Project topics
- Tree planting (sci)
- Culminating project (urban planning for social, environmental, & economic sustainability)
Examining the mix of science & social studies

Investigation topics (can be flexibly sequenced):
- Observing: Ecology, built environment (*sci & SS*)
- Trees & ecological services (*sci & SS*)
- Urban Heat Islands (*sci*)
- Zoning (*SS*)
- Built Environment activity (*SS*)
- Transportation (*sci & SS*)
- Carbon sequestration lab (*sci*)

Project topics
- Tree planting (*sci*)
- Culminating project (urban planning for social, *sci & SS*)
  environmental, & economic sustainability)
Zoning investigation

School is at nexus of many zones...
Zoning investigation ...but some are not easily distinguishable to viewer!
Zoning investigation
Waypoints to structure / spread out data collection
Zoning investigation

Student data collection results
Zoning investigation

Juxtapose student data against city zoning map
Zoning investigation

Discussing discrepancies, propose changes
...and now to pivot from Zoning to Built Environment

...any questions about the zoning investigation?

...next step in sequence is the Built Environment activity

(Zoning essentially just a stage-setter, getting them to look at their built environment with new / critical eyes)
Built Environment

Evolution in our instructional design: From sandbox...
...to Story Map: Scaffolds the instruction, chunks the analysis for students
Built Environment  Studying data layers: Demographics, education, safety, etc.
## Built Environment

Propose two changes to the city to better meet needs

<table>
<thead>
<tr>
<th>In what ward will you make a change?</th>
<th>My first ward</th>
<th>My second ward</th>
</tr>
</thead>
<tbody>
<tr>
<td>What does this ward need more (or less) of?</td>
<td>Education</td>
<td>Education</td>
</tr>
<tr>
<td>Safety</td>
<td>Safety</td>
<td></td>
</tr>
<tr>
<td>Recreation &amp; leisure</td>
<td>Recreation &amp; leisure</td>
<td></td>
</tr>
<tr>
<td>Medical care</td>
<td>Medical care</td>
<td></td>
</tr>
<tr>
<td>What will you add (or subtract) in this ward? (Example: A library, a police station)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explain the connection between the NEEDS in this ward and the RESOURCE that you want to add.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Built Environment

Sample final product
Sequencing for “critical geography” & a curriculum in tandem

1. Zoning investigation
2. Built Environment activity
3. Transportation investigation
4. Culminating project (urban planning for social, environmental, & economic sustainability)

“Geographic reasoning is essential to the development of citizens as informed decision-makers who creatively participate in a diverse, democratic society and in an interdependent world”

- Kenreich, 2008, p. 129
(As promised!)

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