General Writing Guidance:

Driving Question/Title Why do some neighborhoods in the City of Los Angeles with active oil wells have more community-level health issues related to oil well operations than other neighborhoods in the same city that also have active oil wells?		
Grade or Grade Band 9-12	Discipline (LS, ES, PS) ES	Time: 3-4 50-minute sessions, depending on how much discussion time is built into each section

Lesson Level Performance Expectation (teacher-facing):

Analyze and interpret data to identify patterns in the community health impacts of oil and gas extraction.

Design alternative solutions to improve community health outcomes considering social and environmental impacts based on empirical evidence of cause and effect.

Snapshot: High school students evaluate an example of environmental injustice and brainstorm solutions to address the problem.

High school students explore differences in health outcomes between neighborhoods in Los Angeles that have oil wells but differ in sociodemographic characteristics, specifically race/ethnicity and income. They read two vignettes that immerse them in the lives of two students who live in communities with oil wells in Los Angeles. Students then learn about historic redlining practices from the Home Owners' Loan Corporation (HOLC) and how that relates to the current day health, wealth, quality of schools, etc. of these communities. Students evaluate maps and an infographic related to HOLC grades and oil wells. They also evaluate data from a community health and opinion survey. They brainstorm solutions to the environmental injustice issue of oil wells in Los Angeles. Finally, they develop an action plan to address a local environmental injustice problem.

What Students Will Figure Out (Student Facing Objective)

- Student Objective 1: Experience the differences in the lives and health risks between teenage girls who live in neighborhoods in the same city that both have active oil wells.
- Student Objective 2: Evaluate how historic federal housing policies (i.e., redlining) and unequal enforcement of the California Environmental Quality Act (CEQA) can contribute to disparities in community health for Black, Indigenous, People of Color (BIPOC) communities.
- Student Objective 3: Develop an action plan to address a local environmental injustice problem.

Materials

Student Materials	Teacher Materials	Resources for Building Teacher Content Knowledge
Per Student ● Computer to evaluate historic housing policy maps and compare the number of oil wells in a specific area.	● Background reading to explore racial justice issues. ○ Why We Can't Wait By Dr. Martin Luther King Jr. ○ A Hidden Wound by Wendell Berry ○ How to Be an Antiracist by Ibram X. Kendi	● Setting the stage for discussing racial inequities. ○ National Education Organization ■ 10 principles for talking about race in schools ■ Seven Harmful Racial Discourse Practices to Avoid ■ Recommendations and Conclusions for Talking About and Centering Race ■ Racial Justice in Education: Key Terms and Definitions ■ FAQs When Talking About Race ○ National Science Teaching Association ■ Investigating Environmental Racism in the High School Biology Classroom ○ California Coastal Commission ■ Environmental Justice Resources for Educators and Students ● Why is oil and gas found in particular geologic locations? ○ Scientific American

Phenomenon: Why do two teens living in the same city with active oil wells experience such differences in the oil operations in their respective communities?

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Practice <u>Asking Questions and Defining Problems:</u> ● Identify and/or seek additional information. ● Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical and/or environmental considerations. ● Ask questions that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information. <u>Analyzing and interpreting data</u> ● 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. <u>Obtaining, evaluating, and communicating information</u> ● Compare,integrate and evaluate sources of information presented in	**DCI Component** <u>ESS3.A: Natural Resources</u> ● All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors. <u>ESS3.C: Human Impacts on Earth Systems</u> ● Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation. (HS-ESS3-4) <u>ETS1.B: Developing Possible Solutions</u> ● When evaluating solutions it is important to take into account a range of constraints including cost, safety, reliability and aesthetics and to consider social, cultural and	**Crosscutting Concept** <u>Cause and Effect</u>: ● Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. <u>Patterns:</u> ● Empirical evidence is needed to identify patterns.

different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem. <u>Engaging in argument from evidence</u> ● Evaluate competing design solutions to a real-world problem based on scientific ideas and principles, empirical evidence, and/or logical arguments regarding relevant factors (e.g. economic, societal, environmental, ethical considerations.	environmental impacts. (HS-ESS3-2 and HS-ESS3-4.)	

This lesson could be one in a series of lessons building toward:
HS-ESS3-2: Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

Teacher Preparation

Driving Question: Why do some neighborhoods in the City of Los Angeles with active oil wells have more community-level health issues related to oil well operations than other neighborhoods in the same city that also have active oil wells?

What Students Will Figure Out (Student Facing Objective)

- Student Objective 1: Experience the differences in the lives and health risks between teenage girls who live in neighborhoods in the same city that both have active oil wells.
- Student Objective 2: Evaluate how historic federal housing policies (i.e., redlining) and unequal enforcement of the California Environmental Quality Act (CEQA) can contribute to disparities in community health for Black, Indigenous, People of Color (BIPOC) communities.
- Student Objective 3: Develop an action plan to address a local environmental injustice problem.

Required Student Prior Knowledge

No specific prior knowledge required.

Teacher Content Knowledge

Los Angeles is home to extensive oil drilling operations sited near sensitive areas such as homes, schools, youth centers, and churches. These oil drilling operations are concentrated in Black and Latinx communities. These frontline communities or communities that face the 'first and worst' impacts often have multiple co-occurring toxins from multiple sources such as auto body shops, oil refineries, and oil wells. Neighborhood oil drilling sites greatly increase and compound a slew of toxic emissions such as fine particulate matter (PM2.5), nitrogen dioxide, sulfur dioxide, crystalline silica, methanol, hydrochloric acid, 2-butoxy ethanol, hydrofluoric acid, formaldehyde, aluminum oxide, glutaral/pentanedial, xylene, isopropanol, ethylbenzene, naphthalene, and likely many other chemicals that are unknown due to industrial trade secret protections. Many of these are volatile organic compounds, a class of chemicals that are associated with adverse health outcomes, including elevated cancer risk. Additionally, there are many chemicals that are reported to be used on-site at oil fields, but for which there is no information as to whether they are toxic. Neighborhood drill sites in environmental justice communities are often powered by diesel generators and frequently serviced by diesel trucks. As a result, communities living in close proximity to oil drilling and production operations are subject to dangerous chemicals from oil operations and also exposed to high concentrations of diesel particulate matter — both of which have harmful human health outcomes.

Residents and environmental justice advocates in Los Angeles long-noticed that the approach to oil drilling permitted in the City of Los Angeles differed based on the neighborhood where oil drilling took place. The City provided more stringent review of and imposed greater restrictions on oil operations in affluent, white communities compared to low-income, Black and Latinx communities. For example, in low-income, BIPOC communities the City did not conduct an environmental review of potential impacts, which is required by California law, and the City allowed weak community protections. These differences lead to higher pollution emissions and adverse health outcomes for BIPOC neighborhoods. Two communities impacted by these issues are Wilmington and South Los Angeles. In 2015, a Black, Indigenous, and People of Color (BIPOC) youth group from these neighborhoods, Youth for Environmental Justice and South Central Youth Leadership Coalition, together with a national environmental organization, sued the City of Los Angeles to seek remedies under the law.

The Youth for Environmental Justice case alleged two claims: (1) violation of the California Environmental Quality Act (CEQA) by systematically rubber-stamping expanded oil well operations without conducting individual environmental review; and (2) violation of anti-discrimination protections granted by Section 11135 of the state's Government Code. The latter claim alleged that "the City and Planning Department exhibit a pattern and practice of developing and approving weaker conditions for drill sites in communities where a vast majority of the residents identify as Latino and Black." These weaker oil drilling restrictions included operating delivery trucks for longer hours during the day and more days during the week, employing diesel instead of electric rigs, requiring less of a setback buffer between residents' homes and oil operations,

having lower walls surrounding oil operations, and failing to enclose drilling rigs. Diesel trucks and diesel oil drilling rigs increase local pollutants, especially fine particulate matter, which is harmful to human health. Less distance between homes and oil operations and a failure to enclose drilling rigs also increases exposure to local air, water, noise, and light pollution, again, with negative consequences for human health.

The youth plaintiffs further alleged that in reviewing drilling applications, the City did not consider the community character and well-being of their neighborhoods like it did as to white, affluent communities, where the City required structures to have "the appearance of a high-rise building;" "derrick structure[s] shall include architectural features with visual interest;" and "the setback areas must be landscaped with lawn, ivy, or other green ground cover, and planted with trees and shrubs to be maintained in first-class, attractive condition at all times."

In response to the youth group lawsuit, the City of Los Angeles changed its policy and process by which it must now review applications for drilling activity, and thereby stopped rubber-stamping approvals for new oil wells and oil site expansions throughout the City. Unfortunately, the California Independent Petroleum Association countersued the youth group in an effort to intimidate and silence them, as well as the City. In the end, the oil lobby groups approach was unsuccessful because the youth group filed an anti-SLAPP (Strategic Lawsuits Against Public Participation) motion to discuss the countersuit, and a state court of appeal dismissed the case against the youth group.

These youths' efforts and the long term organizing efforts of many environmental justice organizations led to a groundswell of support for eliminating the harmful impacts of neighborhood oil drilling; in January 2022, the Los Angeles City Council unanimously voted to end oil drilling in the City of L.A.

This is a specific instance with a positive outcome: it is a significant victory, but many low-income and BIPOC communities face multiple environmental injustice issues (e.g., oil wells, industrial facilities, freeways etc. all in one community). And governmental agencies charged with regulating pollutive industries and protecting all communities equally are, at best, slow and, at worst, actively bolstering the status quo that perpetuates systemic discrimination and environmental injustice (Pulido et al. 1996; Morello-Frosch et al. 2001; Pastor et al. 2005; Sadd et al. 2011).

Further Reading for Teachers

Cumming, D.G., 2018. Black Gold, White Power: Mapping Oil, Real Estate, and Racial Segregation in the Los Angeles Basin, 1900-1939. Engaging Science, Technology, and Society 4, 85–110.

Garcia, E., Urman, R., Berhane, K., McConnell, R., Gilliland, F., 2019. Effects of policy-driven hypothetical air pollutant interventions on childhood asthma incidence in southern California. PNAS 116, 15883–15888. https://doi.org/10.1073/pnas.1815678116

Gonzalez, D. J. X., Nardone, A., Nguyen, A. V., Morello-Frosch, R., & Casey, J. A. (2022). Historic redlining and the siting of oil and gas wells in the United States. *Journal of Exposure Science & Environmental Epidemiology*, 1–8. https://doi.org/10.1038/s41370-022-00434-9

Pulido, L., 2000. Rethinking Environmental Racism: White Privilege and Urban Development in Southern California. Annals of the Association of American Geographers 90, 12–40. https://doi.org/10.1111/0004-5608.00182

Shamasunder, B., Collier-Oxandale, A., Blickley, J., Sadd, J., Chan, M., Navarro, S., Hannigan, M., Wong, N., Shamasunder, B., Collier-Oxandale, A., Blickley, J., Sadd, J., Chan, M., Navarro, S., Hannigan, M., Wong, N.J., 2018. Community-Based Health and Exposure Study around Urban Oil Developments in South Los Angeles. International Journal of Environmental Research and Public Health 15, 138. https://doi.org/10.3390/ijerph15010138

Wichmann, F.A., Müller, A., Busi, L.E., Cianni, N., Massolo, L., Schlink, U., Porta, A., Sly, P.D., 2009. Increased asthma and respiratory symptoms in children exposed to petrochemical pollution. Journal of Allergy and Clinical Immunology 123, 632–638. https://doi.org/10.1016/j.jaci.2008.09.052

Experience the Phenomenon or Experience the Problem

Summary: In this section students will read two vignettes and experience environmental injustice from the perspective of high school students living in different neighborhoods in Los Angeles, specifically, Wilmington and West Pico. These vignettes give students a visceral experience of what it might be like to live in a neighborhood with active oil wells, and how that can impact the health of people they love. Students will be asked to compare and contrast the details presented in each vignette.

1. **Students read two vignettes, observe differences and similarities, and then discuss as a class.**

   Vignette 1 West Pico Student, Abigail.

   Vignette 2 Wilmington Student, Lucía.

Students can read both vignettes and write down any similarities or differences they observe. Here is an observation/question worksheet they can use for their 'alone zone' time after reading the vignettes.

Probing questions to ask students:

- What are some differences or similarities you noticed about Abigail and Lucía's neighborhoods?
- Both of these neighborhoods have active oil wells, but does there seem to be a difference in the impacts of these oil wells in Abigail vs. Lucía's neighborhood?
- What sort of data was Lucía interested in collecting?
    - Did she think that she would be able to get an accurate picture of the air pollution in her community from the data sources she had access to?
    - What sources of data would you want to have to evaluate the air pollution?
    - Who would have access to the data? For example, where would it be posted—a community center, schools, governmental offices?.

Some questions students may have or Some things students might notice:

- Lucia's neighborhood has more air pollution, grime on the phone, and big-rig trucks and noise. Abigail's neighborhood doesn't have these issues.
- Why did one community have lots of big truck traffic early in the morning for the oil wells while the other did not?
- There are differences in health—Lucía's little sister is so sick.
- In Lucia's neighborhood, the oil operations are prominent and have lots of visibility, but that's not true in Abigail's.
- Why are there differences between the neighborhoods? Where are the neighborhoods located — are they close together or far apart?
- Why are oil wells so prominent in one community and not the other?
- Why are there so few air monitoring stations?
- Why don't air monitoring stations actually monitor all the different types of pollutants that can come from oil operations?
- Shouldn't there be protections against air pollution from neighborhood oil wells?

Sample Student Responses and/or Questions:

- Why are there differences between the neighborhoods? Where are the neighborhoods located—are they close together or far apart?
- Why are oil wells so prominent in one community and not the other?

- Why did one community have lots of big truck traffic early in the morning for the oil wells while the other did not?
- Why are there so few air monitoring stations?
- Shouldn't there be protections against air pollution from neighborhood oil wells?

After each activity, ask the class to come to a consensus on the big ideas from that specific activity. Write these on chart paper to return to towards the end of the lesson when students will synthesize what they have learned. For the vignettes, encourage students to develop a consensus of the big ideas from reading about Lucía's neighborhood in Wilmington and Abigail's neighborhood in West Pico.

Some big ideas students may converge upon:

- While both Lucía's and Abigail's neighborhoods have active oil wells, Lucía's neighborhood appears to be more impacted in terms of air pollution, noise pollution, and negative community health outcomes.
- The oil operations are much more prominent in Lucía's community and much more hidden in Abigail's.
- There are too few monitoring stations to measure the differences in pollution between different parts of the neighborhoods.
- The pollution monitoring stations do not actually measure all the different types of pollution that impact people's health.

2. **Students watch a video about historic U.S. federal housing policy that ranked communities in a racially discriminatory manner.**

Ask for student reflections and reactions. If students are struggling, here are some suggested prompts:

- What did you find surprising? (Perhaps, that it was totally legal to exclude Black families from specific neighborhoods)
- How might historical racial discrimination in housing policy impact other aspects of a community such as health, wealth, schools, and policing? Teachers can write health, wealth, schools, and policing on a whiteboard and jot down all the students' ideas for each category.
- What does the term redlining mean, which HOLC grade is considered “redlined”? How does redlining impact a community’s health, wealth, schools, and policing?

Some big ideas students may converge upon:

- Historic federal housing policy from the 1940s is still impacting community outcomes.
- Even though this was a specific *housing* policy, it impacts many critical areas, including community health, wealth, school investment, and policing.

Investigate the Phenomenon

Summary: It is, of course, not ethical to conduct an experimental study that exposes some communities to harmful pollutants to evaluate, empirically, that the pollutants cause negative health impacts. Instead, scientists in the areas of political ecology, epidemiology etc. focus on matching communities—for example, a low-income Latinx community *with* oil wells and a low-income Latinx community *without* oil wells. For each data source below, have students consider how they would match particular communities to compare them to make claims about causes and effects.

There are three data resources students explore:

- Maps for the City of Los Angeles that allow students to explore spatially the Home Owners’ Loan Corporation (HOLC) grades (have students recall what the grades were A, B, C, D) and the oil well density within differently ranked communities;
- A map of the U.S. and an infographic that reports on data of oil wells within different HOLC grades in Los Angeles and 16 other cities across the U.S.
- Data from a community health and opinion survey conducted in three neighborhoods in the City of Los Angeles—Pacoima, Wilmington, and West Pico.

1. **Students explore HOLC maps and oil wells in Los Angeles.**

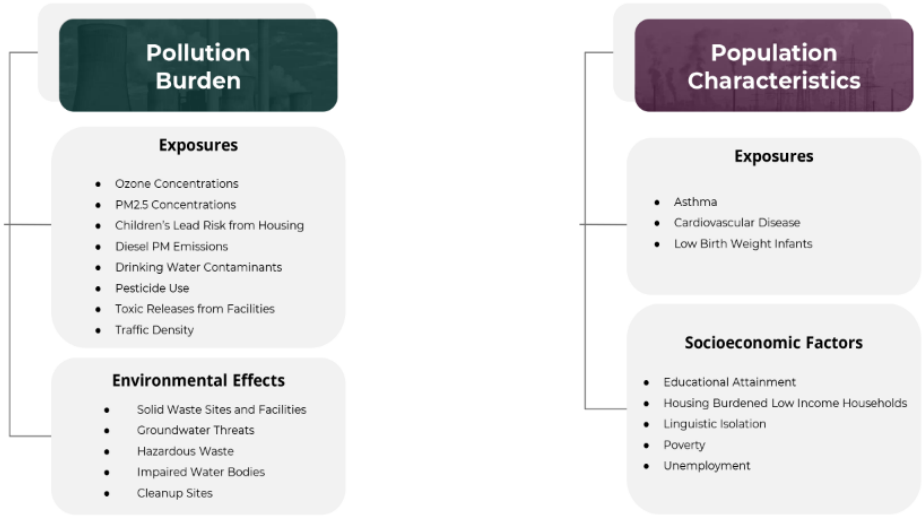
Read and explore the map resource for Los Angeles.

Each student explores the map resource with the different options for a few minutes, zooming in and out and toggling on and off the different radio buttons.

Ask if they noticed the CalEnviroScreen Score and what that might mean.

To explore the CalEnviroScreen Score, project the components to allow students to understand the score. Then ask them to write a one-sentence definition of the CalEnviroScreen Score based on the image and one-sentence explanation of what a high score means.

Students might develop something like: “CalEnviroScreen Score: pollution score burden that combines social variables (such as frequency of heart disease) and pollution variables such as Particulate Matter 2.5 (PM2.5) emissions. A high score of 90-100% would be a neighborhood that had poor community health and a lot of pollution.”



- To get the CalEnviroScreen score we multiply the Pollution Burden score by the Population Characteristics score.

Now that students understand the CalEnviroScreen Score, ask them to click on the link for the map and explore in more depth. Specifically, have students identify the patterns.

Questions/observations students might have:

- Why is there a 100m buffer around an oil well? (Air pollution disperses.)
- Why do many areas of the map not have an HOLC grade? (These data are from the 1940s so not every area is covered.)

Encourage students to find patterns in the data. Suggested prompts include:

- Ask students which HOLC grades they would compare as a 'matching' community vs 'differing' community. What patterns do you see among the different areas?

Have students share the patterns they notice and record them. Then use what they notice to dig deeper; Some prompts that encourage students to expand their thinking are:

- Do they notice any patterns between, for example, HOLC D graded neighborhoods and 90% CalEnviroScreen Score?
- What patterns do they notice with the oil wells and HOLC grades? Are there more or fewer oil wells in A compared to D?
- Or, patterns in where C and, especially, D neighborhoods are located (Downtown, Port of LA etc.) while B, and especially A tend to be the suburbs. (The Pulido 2000 reference cited earlier has an excellent description of this spatial process.)
- Ask students to consider why these patterns might exist and what it could mean for the families living in these different areas?

Some big ideas students may converge upon:

- To evaluate similarities across communities, you could match communities that the HOLC ranked similarly. For example, you could match C and D communities, C and B communities, and A and B communities. To evaluate differences, you could compare A and D communities.
- There seems to be patterns in where A communities are located (suburbs and generally not close to oil wells) compared to D-graded communities (inner city and L.A. port with oil wells).
- The CalEnviroScreen Score uses both social and environmental variables to create a score to rank how strongly environmental injustices impact a specific community.
- There seems to be a pattern of high CalEnviroScreen Scores and D, C communities and low CalEnviroScreen Scores and A communities.

Optional activities:

1. The introduction to the map resource has links to different scientific articles and a newspaper article. Students could delve into these resources using a jigsaw activity, reading the newspaper article or abstracts/highlights of the four scientific papers. Each resource delves into how oil wells impact air, noise, water, or health. The final scientific paper explores the frequency of oil well density across HOLC grades (the infographic below is based on this study by Gonzalez et al 2022).
2. Have students explore HOLC maps from the Mapping Inequality Project. Is their city listed? If so, have them explore their city and neighborhood. If not, encourage them to explore a city/neighborhood that they have visited or want to visit.

Students evaluate a map and infographic that explore data from Los Angeles and 16 other cities across the U.S. with oil operations.

Figure 1 from Gonzalez et al. 2022, [which can be projected.]

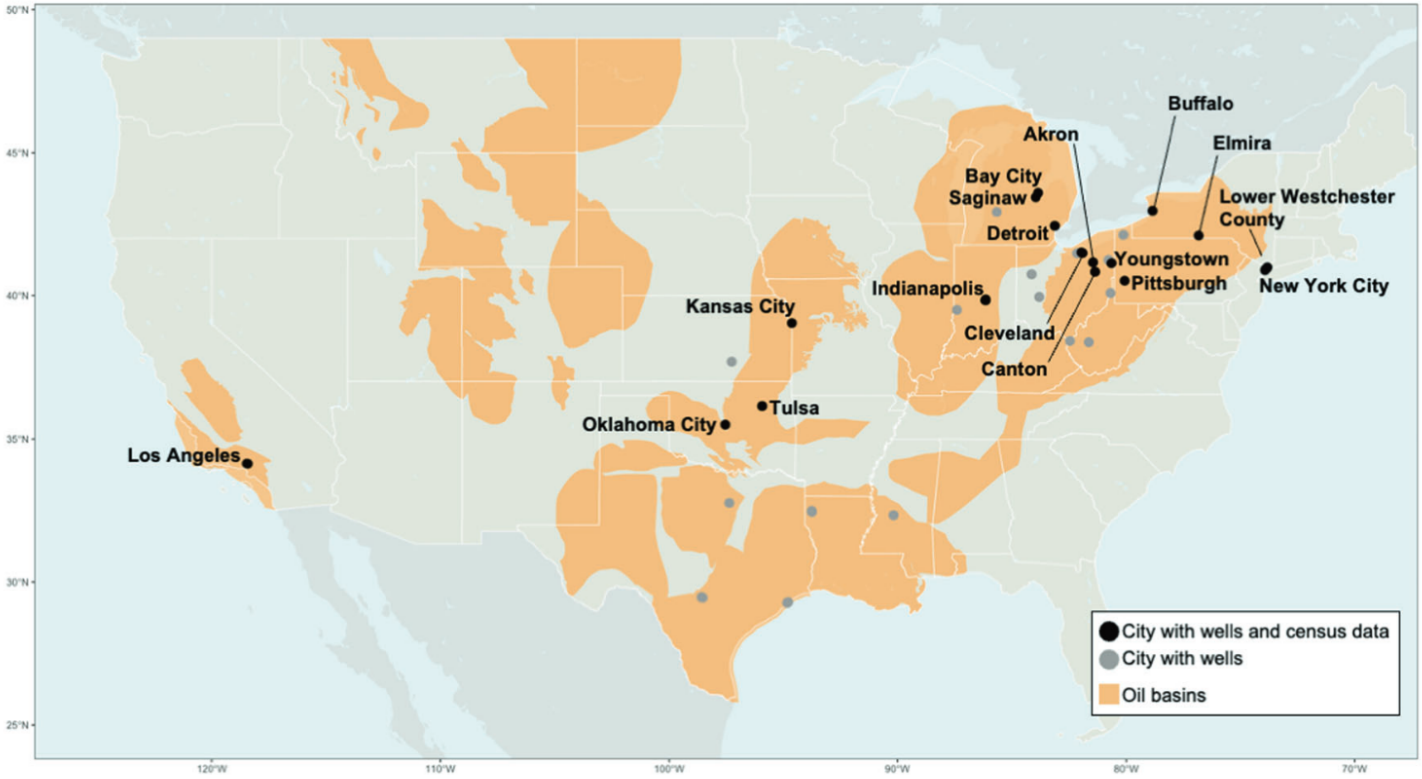


Fig. 1 Map of cities included in the study, including cities with 10 or more wells within 100 m of neighborhoods appraised by the Home Owners Loan Corporation (HOLC). All cities included in the study were appraised by HOLC and census tract-level data from the 1940 census were available for a subset of 17 cities (labeled).

Questions/observations students might have from the Figure 1 map:

- Why are oil reserves only in particular regions?

- What is census data?
- What is an oil basin? (A basin is a depression in the crust of the Earth; an oil basin is a basin that has oil deposits.)
- Why were cities in the Midwest, Texas etc. not included since they have oil basins? (Census data were not available to be able to compare the HOLC grades.)

- Why are oil wells drilled more in some communities but not others? (Companies decide where to drill wells based on many conditions, including geological factors (i.e. how deep are the oil reserves), the available technology, economics (will it be profitable), and any local or state policies designed to protect people living nearby. Also, based on the findings from Gonzalez and colleagues (2022), companies also appear to take into account the race and socioeconomic status of people living within the community.)

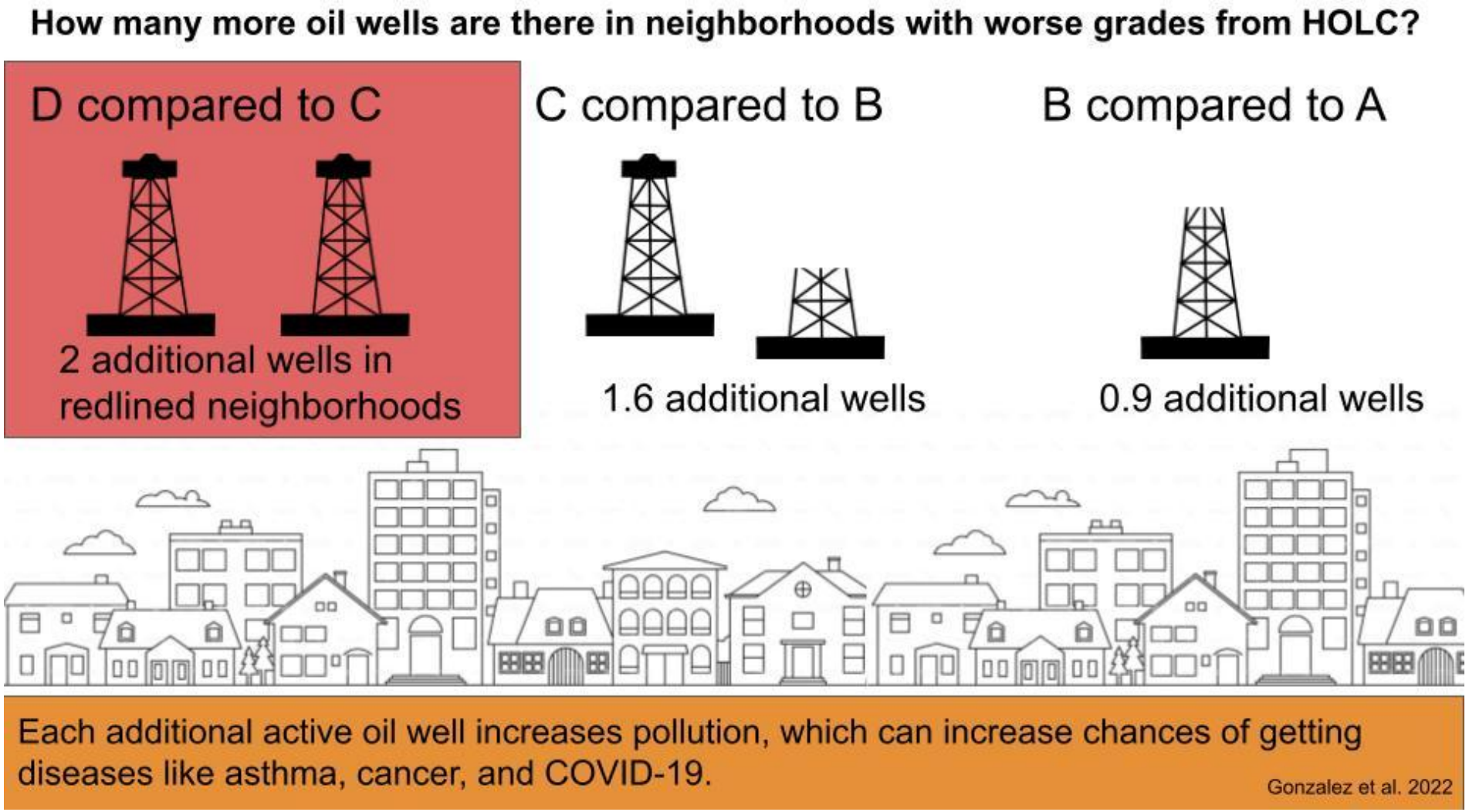
Students evaluate an infographic with data sourced from Gonzalez et al. 2022.

- After viewing the infographic, ask students to develop an explanation to the question of matching neighborhoods that were graded differently by HOLC. Why might C-D be matched; or C-B; or A-B? If they do not converge on this answer, explain that the HOLC grades C-D, C-B, and A-B could sometimes have similar sociodemographic attributes: in other words, a low-income Latinx community was graded D but a similar low-income Latinx community was graded C. So, for example, we can use these matches to compare the differences in oil wells between a D-graded low-income Latinx community and a C-graded low-income Latinx community. And A-graded communities were likely to be very different from D-graded communities.

Project the infographic based on data from Gonzales et al 2022 and ask students to discuss what they see on the infographic with their shoulder partner.

Questions/observations students might have:

- Why would old housing policies from HOLC *still* impact communities today?
- Isn't there something someone should do to make sure communities do not face these differences in oil operations and health outcomes?
- Why does exposure to only one additional active well cause such strong health impacts?
- Why did the researchers map A to B, B to C, C to D, but not other combinations like A to D?



Some big ideas students may converge upon:

- When similar communities are matched, the lower-graded community has more oil wells. This pattern is most significant in redlined (D-graded) communities, which have two additional oil wells compared to C-graded.
- Communities that were graded as A or “desirable” have the lowest number of oil wells.

- Any additional oil wells have a strong negative impact on community health.
- Historic federal housing policy *still* impacts communities, especially those graded as “D.”

Students evaluate community health data from Wilmington, West Pico, and Pacoima.

The California Environmental Quality Act (CEQA) regulations apply equally to all neighborhoods in California—so they should be equally protected.

Students explore the data through this worksheet to evaluate how the community health and opinion data differs between neighborhoods that are all protected under the California Environmental Quality Act.

Some big ideas students may converge upon:

- All communities should be protected equally by the California Environmental Quality Act.
- Both Wilmington and West Pico have active oil wells, but community health conditions were worse (up to 10 times worse!) compared to both West Pico and Pacoima.
- Compared to West Pico and Pacoima, Wilmington residents did not feel safe from pollution and did not think that their local government cared about their well-being.

Explain or Model the Phenomenon

Summary: Encourage students to ask questions and define the problems they have encountered thus far from careful observation of the phenomenon. Specifically, revisit the chart where students’ developed the big ideas for each activity. Are there any additional questions to ask or problems to define or big ideas to describe now that they have explored these data? Then, have student pairs construct explanations for the phenomenon, arguing from the evidence they have evaluated. Student pairs then present their explanations and arguments to the class. Finally, the entire class converges on a consensus of the explanations for the phenomenon based on the evidence.

Probing questions to ask student pairs or the class as they are constructing explanations and arguing based on evidence:

- What connections can you make between Lucía’s neighborhood in Wilmington, HOLC grades, and oil operations?
- What connections can you make for Abigail's neighborhood in West Pico?

- If the California Environmental Quality Act is supposed to protect all people in all neighborhoods, why does Lucía's community have significantly worse community health outcomes? And why do HOLC graded neighborhoods have progressively more oil wells?
- Encourage students to think back to the video, specifically, enforcement: the video states that the "Fair Housing Act was selectively enforced, if at all." Thinking about environmental regulations—do you think the same issue might be coming up here too? Are environmental and health protections always enforced equally? (No. And the result is that low-income, BIPOC communities have more polluted air compared with white, affluent communities.)
- If necessary, guide students to understand that the City of L.A. was not enforcing the California Environmental Quality Act (CEQA). (Background: The City was rubber-stamping oil operation expansions with no environmental review, which is a requirement of CEQA. This lack of enforcement allowed oil and gas operators exemptions to the CEQA review. So, people in the community did not have a voice in the process, which is required under CEQA, and an assessment of potential environmental and health consequences was not done. Conclusion: The City created requirements for oil drilling that were less protective of health, safety, and welfare in BIPOC communities. In summary, the main issues here were that CEQA was not followed, and the conditions required for oil operators differed based on the majority demographics of the neighborhood, which increased exposure to the harms of oil operations within BIPOC communities.

1. **Brainstorm solutions and look at sample solutions described.**

Brainstorm

- As a class, create a t-chart that describes the criteria and constraints of a successful solution to the problem. The teacher can record as the students discuss them. These may include:
  - Criteria: protective conditions are created equally for all communities, enforcement, oversight etc.
  - Constraints: monetary constraints, sufficient people on government staff to ensure oversight etc.
- As students brainstorm solutions, have the class discuss how each solution meets the necessary criteria and constraints. How might environmental injustice be addressed? Support students in their brainstorming by asking them to consider the components at play in the regulation of the oil operations and to consider which component(s) their solution changes and how it can impact health outcomes.
- Technical solution example:
  - As Lucía noted in her science project, there were very few air quality monitors in her area. What if all schools had air quality monitors and pollution data was freely available to everyone? Then, we could have specific evidence of the air

quality at, for example, each school throughout the days, months, seasons, and years. We could compare the air quality at all schools in an entire school distinct, or the entire state, or multiple states. The air quality data could be compared across demographics: How healthy is the air in most low-income/minority neighborhoods compared to affluent/White neighborhoods? With evidence in hand, we have the first step to make changes to fix these problems.

- Legal solution example: Show students a series of short videos about the youth in South Los Angeles and Wilmington. After watching the videos, discuss how legal solutions are designed to meet the criteria and constraints as well.
- **Videos of lawsuit**
  - Environmental Racism/environmental injustice: https://www.youtube.com/watch?v=Aa62mFiKL6s (1:40 video)
  - The teens: https://www.youtube.com/watch?v=Mug3ibvCu9I (1:40 video)
  - The lawsuit: https://www.youtube.com/watch?v=zNsbnsAOyUg (2:16 video)

Students consider a local environmental injustice issue and develop an action plan.

The idea of environmental justice is simple — it's about our everyday lives. It's the idea that all people, regardless of race, ethnicity, class, etc., have equal access to clean air, water, nutritious food, parks, etc. We want health and safety protections against polluting companies and do it in a way that ensures that all communities breathe cleaner air, and are not subjected to health and safety harms. And, importantly, that all communities have an equal enforcement of laws and regulations intended to keep the air that they breathe clean. In cases of racism such as unequal development of environmental protections, there are specific actions we can take to regress these problems such as technical (air pollution monitors) or legal (lawsuits) actions. Have students consider a local environmental injustice and develop an action plan, describing criteria and constraints.

- LINK UCLA EJ VIDEO ONCE COMPLETED

Probing questions for students to think about issues within their own community or nearby communities.

- Are there parallel issues in our specific community to bring to different schools...you might not have oil wells, do you have something similar?
  - Auto repair shops / car painting
  - Polluting industrial facilities
  - Freeways/highways
  - Lack of open space
  - Lack of access to healthy, nutritious food
  - Lack of drinkable water
  - Lead poisoning from paint

- How might you take action to protect a local community? Are there organizations to look into that you could join?

Optional activity:

Another option linked to the vignettes would be:

- to have students finish the stories for Lucía and Abigail with solutions they learned about during the lesson; or
- to have students use their action plan and write their own short stories that detail a specific environmental injustice issue they researched.