

Good for the People, Good for the Planet



5 MODULES



STEM PATHWAY, SCIENCE



What's this unit about?

Students are assuming the role of a member of a fictitious community volunteer organization with a mission of providing free legal advice to residents. Students are tasked with helping the residents of Cancer Alley determine how they might fight against the chemical manufacturers running operations in their area. Students will take on the roles of **Medical Researchers, Environmental Scientists, Policy Analysts, Legal Advisors,** and **Advocacy Managers**. They will work towards a goal of combining their knowledge to confront the stakeholder companies that they choose to name in a fictitious lawsuit in a fictitious pre-trial meeting as they try to attain the best outcome for the residents of the River Parishes.

This project is a partnership between NAF and the New York Department of Education and included an extensive co-design process where NAF and NYC Teachers gave us invaluable feedback and piloted the lessons in their classrooms during the Spring of 2022. Throughout this document, you will find quotes from some of these teachers and their students.

Cultural Responsiveness

This curriculum has been grounded in [New York's Culturally Responsive-Sustaining \(CR-S\) Education Framework](#).

The aim of CR-S is to help “educators create student-centered learning environments that: affirm racial, linguistic and cultural identities; prepare students for rigor and independent learning; develop students’ abilities to connect across lines of difference; elevate historically marginalized voices; and empower students as agents of social change”.

Whenever you see a section in a **green box**, this cultural responsiveness highlight can be used to contextualize the curriculum and offer implementation suggestions.



Learning Framework

Students will learn to:

- Communicate effectively through written formats
- Communicate effectively in a presentation setting
- Understand basic Chemistry, Anatomy, and Physiology (Medical Researchers Team)
- Understand basic Chemistry, Ecology, and Environmental Science (Environmental Scientists Team)
- Analyze public policies and basic legal terminology (Policy Analysts Team)
- Synthesize information for application to law and basic legal terminology (Legal Advisors Team)
- Produce digital content and write effective copy for marketing materials (Advocacy Managers)
- Understand and analyze the socio-cultural issues surrounding Cancer Alley
- Understand how to discover the context of a topic through research

What’s in the unit?

MODULE 1	MODULE 2	MODULE 3	MODULE 4	MODULE 5
Students are introduced to the topic and narrative, split into professional teams, and get started on their research.	We warm up students with a game, continue the narrative, conduct research, do a round of hands-on experiments, and then share-out new knowledge.	Students warm up with a game, continue the narrative, conduct research, do a round of hands-on experiments, and then share-out new knowledge.	Students warm up with a game, continue the narrative, and then prepare for their final presentation.	Students have their final presentation, engage in a Q&A session, and then end the narrative.

MODULE 1

🕒 Introducing the Challenge (30-35 minutes)

Students are assuming the role of a member of LA CitizenAid, a fictitious community volunteer organization based in Louisiana with a mission of providing free legal advice and services to residents. In this unit, LA CitizenAid has been tasked with helping the residents of Cancer Alley determine how they might fight against the petrochemical plants and plastics manufacturers running operations in their area.

“The students were engaged 90% because it was a current news item.”

— Patty C., Co-Design and Pilot Teacher

Setting the Scene

- ▶ **Start:**
 - ▶ Gather students and play the [Unit 1 Trailer](#), to get them engaged with the topic
- ▶ **Explain the narrative:**
 - ▶ *Over the next # weeks, you will all be assuming the role of researchers with LA CitizenAid, a community volunteer organization based in Louisiana with the mission of providing free legal advice and services to the residents of the state. We have just received a letter asking for our help!*
- ▶ **Share narrative material:**
 - ▶ Show and read [☰ Sophie's Letter \(Module 1\)](#) as a group
- ▶ **Introduce topic background:**
 - ▶ Next, introduce the [Vox News piece on Cancer Alley](#) and optionally, distribute the [☰ Landscape Questions Worksheet](#) for students to take notes.
 - ▶ **Attach topic background to the narrative:** *As I was reading/listening to Sophie's letter, I recall seeing a news piece about this that really stuck with me. Let's watch it together to get some background information before we start our research.*
- ▶ **Split into teams:**
 - ▶ Use the [☰ Ranked Choice Team Selection Ballot](#) to allow teams to be split in accordance with their interests
 - ▶ *We're going to split up into five research teams to make sure that we capture multiple perspectives and get the best outcome for Sophie and her community. The teams are: Medical Researchers, Environmental Scientists, Policy Analysts, Legal Advisors, and Advocacy Managers. Think for a moment and figure out what your top 3 choices are. Everyone, move to the area of your top choice.*

Introducing the Teams

Now that the teams have been decided, have them familiarize themselves with what their team focus will be for the project. Distribute the team descriptions to each group so that they can read them together before getting started with their research.

- ☰ [Advocacy Managers Team Description](#)
- ☰ [Environmental Scientists Team Description](#)
- ☰ [Legal Advisors Team Description](#)
- ☰ [Medical Researchers Team Description](#)
- ☰ [Policy Analysts Team Description](#)

Cultural Responsiveness Tip: Why is socio-cultural context important?

In order to understand the full extent of what is happening in the area comprising Cancer Alley, we need to take into account multiple scientific, legal, and ethical considerations. Our way of ensuring these points of view are included is to divide students to dive a little deeper into each subject and then come back together to share and benefit the whole class.

Understanding the cause of pollutants (environmental scientists), how it affects communities (medical researchers), and what residents might do to push back against the companies harming them (policy analysts, legal advisors, and advocacy managers). Give students the tools and perspectives to understand Cancer Alley within its context that has deep-rooted origins in historical inequities and environmental racism.

🕒 Background Research Time (35-40 minutes)

Additional Materials: Computers + Internet Access for Students

Students will continue by doing background research on the first research question that pertains to their team.

Students are encouraged to use all research resources available to them including online searches of newspaper articles, videos from news organizations, academic publications, and more. Students should be reminded that sites like Wikipedia are not citable, but can be useful in finding citable sources through the footnotes of entries.

Students should use the slide deck corresponding to their team to take notes and answer their research questions. Be sure to make a copy of the slide deck so that teams can edit it directly. Also, point out to students that there are sources included to help them if they get stuck.

- ☐ [Advocacy Managers \(Module ...](#)
- ☐ [Environmental Scientists \(Mo...](#)
- ☐ [Legal Advisors \(Module 1\)](#)
- ☐ [Medical Researchers \(Module...](#)
- ☐ [Policy Analysts \(Module 1\)](#)

Knowledge Share-Out (10 minutes)

Ask teams to share 1-2 slides from their research with the rest of the class that the team found to be interesting or were surprised by. Alternatively, teams can share the link to their presentations to share with the rest of the class.

Cultural Responsiveness Tip: How can I differentiate or modify this lesson for my students?

For Students Who Need Additional Support:

- ▶ Consider assigning pairs within teams to have more built-in peer support to allow for partner reading and discussion during research sections.
- ▶ Consider leading the knowledge share-out by asking a series of questions where students can share their knowledge instead of through a slide presentation format.
- ▶ Consider using just 2 or 3 of the teams instead of using all 5 teams. This will allow for each team to be a little bit larger so that each team has more peer and teacher support in addition to reducing the overall scope of the project.

For Students Who Need an Additional Challenge:

- ▶ Consider using the ideas in the “Expansions” header of the “References” section at the end of this curriculum to broaden the scope of the project.

For Students Who Are English Learners:

- ▶ Consider differentiating the research questions into a QSSSA format; Question, Stem, Signal, Share, Assess.
- ▶ When playing any of the videos, turn on the closed captioning. This can help your English Learner students as well as increase the accessibility of the videos for all of your students.

For Classes With Fewer Students:

- ▶ Consider using just 2 or 3 of the teams instead of using all 5 teams. This will allow for each team to be a little bit larger so that each team has more peer support and the overall scope of the project is reduced.

For Combined Classes:

- ▶ Consider collaborating with other teachers from different subjects to divide the unit into more subject-focused sections. For example, an environmental sciences teacher might take on the Environmental and Medical Researchers teams and a history teacher might take the Policy Analysts and Legal Advisors teams, and a visual arts teacher might take the Advocacy Managers team.

*See the end of the “References” section for more information on the CR-S framework which includes some ideas for how you might approach adapting and differentiating lessons.

MODULE 2

Why Game (10-15 minutes)

When conducting experiments or any kind of hands-on examination, we are seeking answers to questions. This warm-up allows for reflection on what makes an experiment or examination most useful in helping us answer questions.

Rules:

- ▶ Students get in groups (doesn't need to be their research/project groups) to play for 2 minutes.
- ▶ The person whose first name is last alphabetically, starts by asking one of the **Why Game Questions** to the person to their left.
- ▶ The next person answers the question, ending their answer with asking “why?”, “how?”, or “what if...?” to pass the question to the next person.
- ▶ This continues until someone cannot answer the question.
- ▶ The person who cannot answer the question, then selects a new “why” question and start the cycle again.
- ▶ After the time is up, everyone reflects together.

Reflection:

- ▶ Did you learn anything new or unexpected from asking clarifying questions so many times?
- ▶ Asking “why” questions is a great way to put yourself in a good headspace for examining an issue or carrying out an experiment.
- ▶ What are 3 ways you can get further clarification into a topic during an experiment or case study?

✔ Sophie's Update (5-10 minutes)

Setting the Scene

- ▶ Start by explaining that there is an update from Sophie.
- ▶ We just received another letter from Sophie - let's see what she has to say.
- ▶ Read (or have a volunteer read) **Sophie's Update (Module 2)** aloud.

Engaging the Teams

Next, have the class go to their teams to prepare for their next round of research. In this round, they will be using the slide decks to keep track of their notes, but they will be presenting the information from their research and experiments in the form of a collage.

✓ Research Time (45-90 minutes)

Additional Materials: Computers + Internet Access for Students

Students will have time to research the following questions. Answering these questions specifically will be essential for students to do their experiments and case studies in the next section.

- ☐ **Advocacy Managers (Module 2)**
- ☐ **Environmental Scientists (Modul...**
- ☐ **Legal Advisors (Module 2)**
- ☐ **Medical Researchers (Module 2)**
- ☐ **Policy Analysts (Module 2)**

✓ Experiments (45-90 minutes)

Teams have their own experiments to do that are related to the questions that they just finished researching. We recommend setting up the room into stations so that teams are already divided up and have their materials ready to save time.

Medical Researchers: ☒ **Health Contamination Lab**

Materials Needed: Water, Vinegar, Baking Soda, pH strips, 20 small cups, measuring cups + spoons

Environmental Scientists: ☒ **Environmental Contamination Lab**

Materials Needed: 12 sturdy pieces of material that measure 12" in length (thin metal tubes, straws, rolled up newspaper, pens, markers, etc.), attachments (only if using tubes, straws, or other hollow materials: 24 pipe cleaners, sturdy wire, or similar), tape, ice cube tray (or similar - for collecting small samples), dry erase marker (or similar - for labeling samples), ☒ **Contamination Observations**, Vinegar, Food Coloring

Policy Analysts: ☒ **Policy Analysts Mock Debate**, ☐ **Policy Analysts Mock Debate Graphic Organizer**

Legal Advisors: ☒ **Legal Advisors Q&A Preparation**, ☐ **Legal Advisors Q&A Notes**

Advocacy Managers: ☒ **Sample Opposition Media**

“Student engagement was at an all-time high [in the last few weeks of school] which gives insight to how enjoyable this project will be at a later point in time.”

— Rebekah B., Co-Design and Pilot Teacher

✔ Knowledge Share-Out: Collage (30 minutes)

Students have been compiling all of their research notes and observations from their experiments and case studies. Give students 15 minutes to create a collage (1 collage per group) that represents their new knowledge. This can be a traditional collage made from paper or students can use the

📄 **Digital Collage Template**. It just needs to be a visual that represents the 1-2 pieces of information from their research and/or experiment that they felt were most important to share with the class.

After the 15 minutes are up, each team will present for no more than 3 minutes to give an overview of what they learned, using the collage as a visual.

CR Tip: How can I differentiate or modify this lesson for my students?

Facilitation Note:

- ▶ The environmental researchers team experiment calls for building a biocube and using it outside - consider coordinating with other teachers/admin if supervision is needed here. If going outside is not possible, consider collecting the data and samples ahead of time so that students are doing the part of the experiment that is in the classroom only.
- ▶ If you modify this experiment in that way - be sure to remove the instructions from the first part of the **Environmental Contamination Lab** to avoid any confusion.

For Students Who Need Additional Support:

- ▶ Consider assigning pairs within teams to have more built-in peer support to allow for partner reading and discussion during research sections.
- ▶ Consider leading the knowledge share-out by asking a series of questions where students can share and explain their collage instead of through a presentation format.

For Students Who Need an Additional Challenge:

- ▶ Consider using the ideas in the “Expansions” header of the “References” section at the end of this curriculum to broaden the scope of the project.

For Students Who Are English Learners:

- ▶ Consider differentiating the research questions into a QSSSA format; Question, Stem, Signal, Share, Assess.

For Combined Classes:

- ▶ If you are collaborating with other teachers, consider recording your student’s collage presentations or leaving them up so that all of the students can see the collages of other classes when they visit your classroom next.

*See the end of the “References” section for more information on the CR-S framework which includes some ideas for how you might approach adapting and differentiating lessons.

MODULE 3

✔ Wikipedia Race (10-15 minutes)

In your groups, race to see who can make it to the “Cancer Alley” Wikipedia entry first.

Rules:

- ▶ Everyone starts on the same page, scrolled all the way to the top
 - Easy: https://en.wikipedia.org/wiki/Missouri_River
 - Medium: https://en.wikipedia.org/wiki/Dracaena_draco
 - Difficult: https://en.wikipedia.org/wiki/Ophyx_excisa
- ▶ Only click on links within the article, topic sidebars, or the “See Also” section
- ▶ Can’t use Ctrl+F/Cmd+F to find words on the page
- ▶ Once you make it to the “Cancer Alley” page, immediately tell your team and ‘show your work’ by going through the browser history to show what connections you made to arrive at the end page

Reflection:

- ▶ What do you think it says about the nature of knowledge that no matter what the page we started on, we eventually made it to the same “Cancer Alley” entry?
- ▶ All knowledge is connected - when we connect enough pieces, we can see the full context of a topic
- ▶ What are 2 ways that we might apply this type of thinking to our research work?

✔ Sophie’s Update (5-10 minutes)

Setting the Scene

- ▶ Start by explaining that there is an update from Sophie.
 - “We just received another letter from Sophie - let’s see what she has to say.”
- ▶ Read (or have a volunteer read)
 -  **Sophie's Update (Module 3)** aloud.

Engaging the Teams

Next, have the class go to their teams to prepare for their next round of research. In this round, they will be using the slide decks to keep track of their notes, but they will be presenting the information from their research and experiments in the form of a reel-style video.

✓ Research Time (60-90 minutes)

Additional Materials: Computers + Internet Access for Students

Students will have time to research the following questions. Answering these questions specifically will be essential for students to do their experiments in the next section.

- ☐ **Advocacy Managers (Module 3)**
- ☐ **Environmental Scientists (Module 3)**
- ☐ **Legal Advisors (Module 3)**
- ☐ **Medical Researchers (Module 3)**
- ☐ **Policy Analysts (Module 3)**

Cultural Responsiveness Tip: Why is it important to show students how topics are interconnected?

Understanding how the different points of view of a topic are interconnected helps students better understand the context and what considerations should be considered during problem-solving.

For instance, without understanding the historical roots of the area and how closely it relates to how modern Cancer Alley came to be, it can be difficult to understand the point of view of long-time residents. They have been suffering from the effects of long-term environmental racism and understanding this background is important when determining the ethics of any solution to the problem residents find themselves facing.

✓ Experiments (60-90 minutes)

Teams have experiments to do that are related to the questions that they just finished researching. We recommend setting up the room into stations so that teams are already divided up and have their materials ready to save time.

Medical Researchers: ☰ **GIS Mapping**

[QGIS](#) (optional - see Resources → Modifications and Extensions)

Environmental Scientists: ☰ **Oil Clean-Up Lab**

You Will Need: Cup, Oil (Vegetable, Canola, or similar), Food Coloring, Tools for Cleaning Out Food Coloring (Hand Sifter, Coffee Filters, Cotton Balls, etc.), ☐ **Oil Clean-Up Observation Sheet**

Policy Analysts: ☰ **Policy Writing**

Legal Advisors: ☰ **Legal Advisors Socratic Seminar**, ☐ **Legal Advisors Socratic Seminar Guide**

☐ **Socratic Seminar Rubric**

Advocacy Managers: ☰ **Sample Media Creation**

Knowledge Share-Out: Reel (30 minutes)

Students have been compiling all of their research notes and observations from their experiments and case studies. Give students 15 minutes to create an Instagram Reel or TikTok-style video (1 video per group) that presents some of their new knowledge. After the 15 minutes are up, each team will present by showing their video to the class and optionally adding additional points they didn't get in the video that they think are worth sharing with the class.

“I really loved that the students spent time doing their own research and then coming together as a team to discuss their findings.”

— Hikeisha C., Co-Design and Pilot Teacher

CR Tip: How can I differentiate or modify this lesson for my students?

For Students Who Need Additional Support:

- ▶ Consider assigning pairs within teams to have more built-in peer support to allow for partner reading and discussion during research sections.
- ▶ Consider leading the knowledge share-out by asking a series of questions where students can share and explain their insights after showing their video instead of through a presentation format.

For Students Who Need an Additional Challenge:

- ▶ Consider using the ideas in the “Expansions” header of the “References” section at the end of this curriculum to broaden the scope of the project.

For Students Who Are English Learners:

- ▶ Consider differentiating the research questions into a QSSSA format; Question, Stem, Signal, Share, Assess.

For Combined Classes:

- ▶ If you are collaborating with other teachers, consider how you might be able to share students' videos with other class periods so that everyone can benefit from the share-out.

*See the end of the “References” section for more information on the CR-S framework which includes some ideas for how you might approach adapting and differentiating lessons.

MODULE 4

✔ Discussion Toss (10-15 minutes)

Discussions and debates are all about being able to think on your feet. This game allows students to practice this skill and warms them up for getting into a discussion/presentation mindset.

Rules

- ▷ Get into your project groups
- ▷ Take 5 minutes to write as many questions related to your team’s research and experiments as you can
- ▷ Toss a ball and ask a question from your list
- ▷ Catcher answers the question and tosses it to the next person, asking them a question from their list
- ▷ If you don’t know the answer, say so and ask the next person the same question you were asked
- ▷ Continue for 5 minutes

Reflection:

- ▷ What did you find most difficult about this activity?
- ▷ What are 3 ways you might prepare to face a situation where you need to think on your feet during a presentation or discussion?

✔ Sophie’s Update (5-10 minutes)

Setting the Scene

- ▷ Start by explaining that there is a final update from Sophie.
 - “We just received another letter from Sophie - let’s see what she has to say.”
- ▷ Read (or have a volunteer read)
 -  **Sophie's Update (Module 4)** aloud.

Engaging the Teams

Next, have the class go to their teams to prepare for their final presentation. They will be using the final presentation deck to compile all of their slides in one spot and then practice how they will present the full deck.

“I enjoyed the discussion it caused, as it genuinely had two fair points for either side.”

— Curriculum Pilot Student

✔ Presentation Prep (60-90 minutes)

Allow students time to create their slides in the **Final Presentation Template** slide deck for the group presentation at the Pre-Trial meeting. Additionally, students should be given the **Presentation Slide Rubrics** so that they understand what is expected of their team's slides.

✔ Test Run (60-90 minutes)

Allow students time to assemble their full presentation and practice as a group how they will present their findings during the Final Boss Pre-Trial Meeting.

Each team will present their slides and then each team will select one spokesperson for the discussion portion. During the discussion, the spokesperson can confer with their teammates, but they will be the voice for their team.

Encourage students to practice a full test run of the presentation and prepare for what they might need to contribute to the discussion with the company representative.

CR Tip: How can I differentiate or modify this lesson for my students?

For Students Who Need Additional Support:

- ▶ Consider assigning pairs within teams to have more built-in peer support when creating slides and presenting.

For Students Who Need an Additional Challenge:

- ▶ Consider using the ideas in the "Expansions" header of the "References" section at the end of this curriculum to broaden the scope of the project.

For Students Who Are English Learners:

- ▶ Consider suggesting that students write out a script for how they want to present their slides that they can practice and use during their presentation to help them if they need it.

For Combined Classes:

- ▶ If you are collaborating with other teachers, consider how you might be able to share the final presentations with all of the classes - perhaps a Google Drive folder (or similar) where students can upload their slide decks after their final presentations

*See the end of the "References" section for more information on the CR-S framework which includes some ideas for how you might approach adapting and differentiating lessons.

MODULE 5

④ Final Preparations (10-15 minutes)

Allow students time to quickly make any final preparations before starting the Pre-Trial Meeting. During this time, all slides should be in the final deck, spokespersons for each team should be selected for the Q&A portion, etc.

“I liked the concept of this where we were “presenting” to a [lawyer].”

— Curriculum Pilot Student

④ Pre-Trial Meeting (60-90 minutes)

The Pre-Trial Meeting is where the students will be presenting their findings to “the representative(s) of the petrochemical plants”. The “representative(s)” could be a teacher or another adult volunteer. The “representative(s)” should listen attentively and take notes during the presentation.

Following the presentation, the “representative(s)” will engage the students in a Q&A discussion. “Representative(s)” should have the  **Company Representative Guide** to help them in the discussion. The discussion ends when either an agreement is reached (a hypothetical out-of-court settlement is determined to be acceptable for all parties) or a decision to go to trial is made by the “representative(s)”.

[Alternative: If you aren’t using the narrative component, instead of a final presentation, teachers can opt to run a Socratic seminar as the final deliverable for students. Note that this would remove the requirement for students to make a slide deck and the preparations in Module 4 would modify slightly to be oriented towards preparing for a seminar. A potential question to pose for this seminar can be: “What should the relationship between petrochemical companies operating in Cancer Alley and local residents be?”]

☑ Sophie's Update (5-10 minutes)

Setting the Scene

- ▶ Start by explaining that there is a final update from Sophie.
“We just received another letter from Sophie - let's see what she has to say.”
- ▶ Read (or have a volunteer read)
 **Sophie's Update (Module 5)** aloud.

Engaging the Teams

Next, have the class go to their teams to prepare for their final presentation. They will be using the final presentation deck to compile all of their slides in one spot and then practice how they will present the full deck.

Cultural Responsiveness Tip: How can I differentiate or modify this lesson for my students?

For Students Who Need Additional Support:

- ▶ Consider assigning pairs within teams to have more built-in peer support when presenting.

For Students Who Need an Additional Challenge:

- ▶ Consider using the ideas in the “Expansions” header of the “References” section at the end of this curriculum to broaden the scope of the project.

For Students Who Are English Learners:

- ▶ Consider suggesting that students write out a script for how they want to present their slides that they can practice and use during their presentation to help them if they need it.

For Combined Classes:

- ▶ If you are collaborating with other teachers, consider how you might be able to share the final presentations with all of the classes - perhaps a Google Drive folder (or similar) where students can upload their slide decks after their final presentations

*See the end of the “References” section for more information on the CR-S framework which includes some ideas for how you might approach adapting and differentiating lessons.

Resources

Research

Are your students stuck during research? First, have them check the resource(s) listed on their research slides. If they need additional support, here are some resources that might help:

StopFormosa.org

[Center for Constitutional Rights - Cancer Alley](#)

[“Waiting to Die”: Toxic Emissions and Disease Near the Louisiana Denka/DuPont Plant](#)

📄 [WaPo Cancer Alley Article.pdf](#)

[US to hold surprise plant inspections targeting pollution in Louisiana’s Cancer Alley](#)

[Clean Air Act Compliance Monitoring](#)

[First slavery, then a chemical plant and cancer deaths: one town's brutal history \(The Guardian Article\)](#)

[EPA Failed to Correct Industry Misinformation About Deadly Air Pollution at Public Meetings \(The Intercept Article\)](#)

[Collective Lawsuit to compel EPA take action in accordance with the Clean Air Act for potential revision of emission standards for Group I Polymers and Resins](#)

[UN Condemns Environmental Racism in Cancer Alley, Naming Formosa Plastics](#)

[Louisiana Chemical Association \(lobbyist group\) handout](#)

Modifications and Expansions

- ▶ Consider collaborating with other teachers from the same or different subjects to divide the unit into shorter, or more subject-focused, sections. If considering this option, we recommend dividing it so that one teacher has 1-3 of the teams so that with all of the teachers combined, all five teams are still present.
- ▶ Consider utilizing your advisory board or professional peer network for the Pre-Trial Meeting; rather than being the representative, an individual professional or a panel of professionals can further the narrative and help students practice their presentation and debate skills in a way that feels more real. It can also let you focus on assessment if you don’t also have to participate.
- ▶ For the GIS Mapping experiment in Module 3 for the Medical Researchers team, instead of using Google Earth, consider using QGIS, a free and open-source GIS software, instead. Their site has tutorials and an extensive manual for users that interested students can utilize to make a more professional and complex GIS map.

UNIT 1

- ▶ Cancer Alley is not an anomaly. One way to expand on this content can be to examine, compare, and contrast with similar case studies such as:

[Water Contaminated by Military Jet Fuel in Honolulu, Hawaii](#)

[Military Uranium Mining and Contamination in Church Rock, New Mexico](#)

[Airborne Toxins in West Oakland, California](#)

[Groundwater Contamination in Hinkley, California by PG&E](#)

[Water Crisis in Flint, Michigan](#)

[Water Crisis in Newark, New Jersey](#)

[Water Contamination at Camp Lejeune in Jacksonville, North Carolina](#)

[Chevron Refinery in Richmond, California](#)

CR-SE Framework

The Culturally Responsive-Sustaining Education (CR-SE) Framework was developed by the New York State Education Department for the purpose of “helping educators create student-centered learning environments that: affirm racial, linguistic and cultural identities; prepare students for rigor and independent learning; develop students’ abilities to connect across lines of difference; elevate historically marginalized voices; and empower students as agents of social change”.

Below are the four principles of CR-SE. The full framework can be found [here](#).



Welcoming and Affirming Environment

Collective responsibility to learn about student cultures and communities.

Close relationships with Students & Families.

Social-Emotional Learning Programs.

Materials that represent and affirm student identities.



Inclusive Curriculum and Assessment

Current events incorporated into instruction.

Students as co-designers of curriculum.

Resources written and developed by racially, culturally, and linguistically diverse perspectives.

Instructional strategies that adapt to diverse learning styles.



Ongoing Professional Learning and Support

Diversity, Equity, and Inclusion Training, examining implicit bias and interrogation of beliefs and assumptions.

Support in aligning curriculum and instruction to the histories, languages, and experiences of traditionally marginalized voices.



High Expectations and Rigorous Instruction

Student-Led Civic Engagement.

Critical Examination of Power Structures.

Project-Based Learning on Social Justice Issues.

Student Leadership Opportunities.