

The people who live in places impacted by human-made decisions have the power to speak out against environmental injustice.

Even though the case studies from this unit can be implemented on their own, it is recommended that at least one activity from Unit 1 and/or Unit 2 be completed prior to beginning one of these case studies.

Note: Each case study consists of a variety of resources - videos, newspaper articles, scholarly journal articles, scientific papers, etc. You do not need to use all of the resources included to complete the case study. There is a recommended reading assignment included that selects one or two sources from the list provided. The primary sources included in this curriculum are presented in their entirety, which may make some of them lengthy. At the teacher's discretion, you may choose to read only a section of a selected resource to allow for whatever time constraints are present in the context of your classroom.

Each case study seeks to answer the following essential questions:

- Who is affected and how? Are they affected differently than other people?
- What is occurring in the environment that is causing this? What data do we need to understand?
- Who is in control of this situation? Who is making decisions and how?
- What power do the people most affected have? What actions were taken to address this problem?
- What are other actions we could take to solve problems like this? Are there solutions that would more equitably address this problem?
- How can I put what I've learned into action in my own life? What problems can I solve in my community?





The following case study are selected from LEAN's way of separating the state into regions.

Case Study Community	Region	
Alsen/ St. Irma Lee	Region 6 (Pointe Coupee, East Baton Rouge, West Baton Rouge, Iberville, Ascension, St. James, St. John the Baptist, St. Charles, Jefferson, Orleans St. Bernard, Plaquemines)	
Colfax (The Rock)	Region 3 (Vernon, Natchitoches, Winn, Grant, Rapides, Cladwell, La Salle, Avoyelles, Catahoula, Franklin, Concordia)	
Grand Bois	Region 5 (Evangeline, St. Landy, Acadia, Lafayette, Vermillion, St. Martin, Iberia, St. Mary, Assumption, Terrebonne, Lafourche)	
Homer	Region 1 (Caddo, Bossier, Webster, Claiborne, De Soto, Bienville, Red River, Sabine)	
Mossville	Region 4 (Beauregard, Allen, Jefferson Davis, Calcasieu, Cameron)	
St. Joseph	Region 2 (Lincoln, Union, Jackson, Ouachita, Morehouse, Richland, West Carroll, East Carroll, Madison, Tensas)	
Mandeville	Region 7 (East Feliciana, Livingston, St. Helena, St. Tammany, Tangipahoa, Washington, West Feliciana)	



St. Joseph



LEAN Region 2

North Louisiana is home to clear water lakes and pine forests. Northeast Louisiana is where you will find rich Native American history including the World Heritage Site at Poverty Point. This region includes:

- East Carroll Parish
- Lincoln Parish
- Jackson Parish
- Madison Parish
- Morehouse Parish
- Richland Parish
- Ouachita Parish
- Tensas Parish
- Union Parish
- West Carroll Parish

About St. Joseph:

The town of St. Joseph has had discolored water for years. After decades of neglect and initial inaction from state agencies, lead was found in the drinking water. Governor John Bel Edwards declared a State of Emergency and the National Guard provided drinking water while the city distribution system was replaced/repaired. LEAN provided technical support to residents early on and has participated throughout the testing and response process including providing water bottles to residents. This effort continues as residents work to eliminate the threat of lead still potentially present within the aged pipes and appliances of their residences. St. Joseph's water problems are one example of approx. 400 water systems that provide inadequate drinking water to residents across the state.

Standards:

English Social Studies Science



Resource	Description
Proclamation Number 180-JBE-2016 (PDF) Source	Official proclamation issued by Gov. John Bel Edwards issuing a state of public health emergency, after water testing in St. Joseph.
Louisiana Department of Health to Begin Water Testing for the Town of St. Joseph <u>Source</u>	2016 press release from the Louisiana Department of Health.
Gov. Edwards Issues Public Health Emergency for the Town of St. Joseph <u>Source</u>	2016 press release from the Louisiana Department of Health.
While One Louisiana Town's Lead-Tainted Water System Is Replaced, Dozens of Others Deteriorate (PDF) <u>Source</u>	DeSmog article profiling the St. Joseph water crisis.
After years with unsafe tap water, St. Joseph residents eager for new system <u>Source</u>	KATC news article about construction of St. Joseph's new water infrastructure
St. Joseph's New Water System Goes Online <u>Source</u>	KNOW article published after the completion of the St. Joseph repairs.
After years with unsafe tap water, St. Joseph residents eager for new system	KATC's Breanna Molloy's Emmy Winning piece on the residents of St. Joseph and their fight for safe drinking water. Length, 4:16

Extended Reading Activity:

Read While One Louisiana Town's Lead-Tainted Water System Is Replaced, Dozens of Others Deteriorate, watch After years with unsafe tap water, St. Joseph residents eager for new system and analyze. Then discuss and answer the essential questions for this unit. Answers will vary to the questions, however students should be able to grasp the basic power dynamics of the situation.





Essential Questions

L.	Who is affected and how?
•	Are they affected differently from other people?
•	What is occurring in the environment that is causing this?
•	What data do we need to understand?
•	Who is in control of this situation?
•	Who is making decisions and how?



Essential Questions (cont.)

7. What power do the people most affected have? What actions were taken to address this problem? 8. What are other actions we could take to solve problems like this? 9. Are there solutions that would more equitably address this problem? 10. How can I put what I've learned into action in my own life? 11. What problems can I solve in my community? 12.



Louisiana Department of Health to Begin Water Testing for the Town of St. Joseph December 19, 2016

FOR IMMEDIATE RELEASE

Contact: govpress@la.gov

BATON ROUGE – Beginning this week, the Louisiana Department of Health will begin testing water for every home in the town of St. Joseph.

Throughout the course of the week, each home will receive an empty bottle and instructions to collect a water sample. Residents can choose to collect the sample on their own; can allow state personnel to collect the sample; or can choose not to participate in sampling.

State personnel will be working throughout the community over the next two weeks to distribute bottle and instructions for sampling, as well as collecting samples. Once the collection of water samples is complete, residents will receive individual letters with the testing results. It will take between two and four weeks for residents to receive their testing results.

Should residents have questions, they are advised to call 1-866-280-7287.

The testing is in accordance with the proclamation issued last week by Gov. John Bel Edwards who declared a Public Health Emergency for the Town of St. Joseph. Residents are advised to use an alternate source for drinking water. On December 15, 2016 test results conducted by the Office of Public Health showed elevated levels of lead in two samples – a private residence and the Town Hall. Also, there were two other sites with elevated levels of copper – both were private residences. The Town of St. Joseph has experienced water problems for years due to the poorly maintained and deteriorating water distribution system. Frequent breaks in the water distribution system provide a potential health risk because of the drop in water pressure.

Out of an abundance of caution, the Louisiana Department of Health recommends that residents use an alternative source of water for personal consumption, including making ice, brushing teeth or using it for food preparation and rinsing of foods.

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) has released one month's supply of bottled water to the Town of St. Joseph. Each



individual will receive 3 liters of water per day. The bottled water supply will serve as a temporary remedy. A more permanent source will be made available to the Town of St. Joseph while construction is underway.

Works Cited

Louisiana Department of Health. (2016, December 19). Louisiana Department of Health to Begin Water Testing for the Town of St. Joseph. Retrieved from Louisiana Department of Health: https://ldh.la.gov/news/4115



Gov. Edwards Issues Public Health Emergency for the Town of St. Joseph December 16, 2016

Today, Gov. John Bel Edwards issued a Public Health Emergency for the Town of St. Joseph in North Louisiana. Residents are advised to use an alternative source for drinking water. On Dec. 15, 2016 test results conducted by the Office of Public Health showed elevated levels of lead in two samples – a private residence and the Town Hall. Also, there were two other sites with elevated levels of copper – both were private residences. The Town of St. Joseph has experienced water problems for years due to the poorly maintained and deteriorating water distribution system. Frequent breaks in the water distribution system provide a potential health risk because of the drop in water pressure.

Out of an abundance of caution, the Louisiana Department of Health recommends that residents use an alternative source of water for personal consumption, including making ice, brushing teeth or using it for food preparation and rinsing of foods.

The Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) has released one month's supply of bottled water to the Town of St. Joseph. Each individual will receive 3 liters of water per day. The bottled water supply will serve as a temporary remedy. A more permanent source is made available to the Town of St. Joseph while construction is underway.

Residents can receive bottled water tonight after 6:30 p.m. at the Town Hall on Main Street.

While initial test results show that the instances of elevated lead and copper levels are exclusive to these locations, Gov. Edwards has ordered testing of every household in the town within four weeks.

Officials from the Edwards Administration are on the ground in the Town of St. Joseph today, and Gov. Edwards intends to personally visit next week to meet with residents and officials.

Works Cited

Louisiana Department of Health. (2016, December 16). Gov. Edwards Issues Public Health Emergency for the Town of St. Joseph. Retrieved from Louisiana Department of Health: https://ldh.la.gov/news/4114



While One Louisiana Town's Lead-Tainted Water System Is Replaced, Dozens of Others Deteriorate

By Julie Dermansky on March 18, 2017 @ 04:57 PDT

For years the discolored water delivered to the northern Louisiana delta town of St. Joseph resembled what one would expect to find in a third-world country. But it wasn't until high levels of lead were discovered in the town's municipal water system that work began to replace it.

On March 6, Louisiana Gov. John Bell Edwards, along with local officials and state lawmakers, attended a groundbreaking ceremony for St. Joseph's new water system, wielding symbolic golden shovels in the parking lot next to city hall.

After tests found lead in the water of city hall and some of the town's homes, Gov. Edwards made an emergency health proclamation on December 16, 2016, enabling a fast-tracked replacement of St. Joseph's water system.

The state began making three liters of water per day available for each of the town's residents. It also came up with \$8 million in funding and expedited the project to replace the municipal water system, which is expected to be operational by September.

For the majority-African American town of some 1,100 people, relief from the ongoing water crisis couldn't come soon enough. For almost a decade, residents, 33 percent of which live in poverty, have complained about the discolored, dirty water that comes out of their taps.

State-issued bottled water has been replaced with potable water in large storage tanks, known as "water buffaloes," stationed around town, where residents can fill up containers with water.

There have been noticeable improvements to the existing water system since the governor's office stepped in, including lessening water discoloration. But for many, the water coming out of their faucets is still a shade of yellow or brown, making washing anything impractical, even though it has been deemed safe to do so.

Wilma Subra, an environmental scientist and technical director for the Louisiana Environmental Action Network (LEAN), is part of a grassroots effort that helped bring St. Joseph's water crisis to the governor's attention. Former General Russel Honoré,founder of the GreenArmy, was instrumental in that effort as well. During the groundbreaking ceremony, Subra warned residents to remain vigilant about keeping their infants from



coming into contact with the municipal water, pointing out that children who ingest lead can end up with lasting health issues.

The Louisiana Department of Health recommended that no one drink the town's water or use it for food preparation, brushing teeth, or making ice. Subra's warning goes a step further. She advises against using the water for anything that goes into children's mouths or for bathing infants until the new system is in place, pointing out that infants tend to put their fingers in their mouths.

Flint's Water Crisis: A Saving Grace For St. Joseph

Roy and Wanda Bowman's house is located a few blocks from city hall. There the two local ministers showed me the rust-colored water flowing from the sink in their kitchen. Were it not for the water crisis in Flint, Michigan, we might not have gotten the help we need, Roy Bowman told me.

"The water here has been bad for at least eight years," Roy Bowman said, "but getting anyone to do anything about it was impossible until Flint's situation was in the news."

St. Joseph's water crisis stems from a 90-year-old system that hasn't been properly maintained, a problem that is not uncommon in other towns in Louisiana and elsewhere. While the water crisis in Flint was caused by an ill-advised decision to switch the city's water supply to the Flint River, corroding their aging lead pipes, the resulting health emergency was the same.

Before lead was detected, St. Joseph's water tested positive for high levels of iron and magnesium, which causes the discoloration. Until the governor declared a health emergency, residents were told by State Health Officer Dr. Jimmy Guidry that the water was safe to drink, though the Bowmans told me that no one they knew was drinking it.

Last year, before lead was found, Bowman offered Guidry water from his home. Guidry declined, acknowledging that drinking discolored water was not desirable.

Wanda Bowman doesn't think the water was safe to drink or wash with before the health emergency declaration, and doesn't believe the potable water now being provided via tanks is safe to drink either, though it is being tested daily. She is not alone. Everyone she knows is sticking to bottled water.

It saddens her that people with so little money have been spending so much to buy water, despite paying water bills too. But she pointed out that not drinking the town's water for so long might have prevented people's health from being compromised.



The state has offered blood tests to pregnant women and children under age six. As of March 13, all of the blood work has tested negative for lead, according to Robert Johannessen, communications director for the Louisiana Department of Health.

New Water System Likely Won't be Quick Fix for All

Once the new system is operational, Louisiana plans to retest homes that previously tested positive for lead to determine if the pipes connecting the municipal line to residences will also require replacement. Many of those pipes are just as old as the town's lines, but those replacements will be the responsibility of the buildings' owners.

According to the governor's office, for those who can't afford it, "the state is working to see what partnerships are available from other sources, such as the [U.S. Department of Agriculture], to help provide some grant or loan assistance to qualified residents with repayment ability."

The residents I spoke to expressed gratitude that the town's water system is being replaced, but no one thinks the obligation to continue paying water bills in full is fair. "I'm not looking for something for nothing," Lee Richardson told me after revealing the brown water that pours into his kitchen sink and bathtub. "I just don't like paying for dirty water."

In response to this point, the governor's office said via email:

"The Governor certainly understands the frustration that comes from paying a water bill, but getting a product that can't be used as intended. No one wants to be in that situation. But, he reminds people that's why – even before the lead situation was found – that he has worked to help the town get the funding necessary to rebuild the water system and bring the community, safe, clean water. He also reminds people the system can only be maintained in the future with all residents paying their bills today and in the years to come."

During the groundbreaking ceremony, Gov. Edwards made it clear that the people in St. Joseph are lucky: "The simple fact of the matter is we can't replicate this effort around the state because we don't have enough money."

General Honoré, who has been advocating for the people of St. Joseph, agrees the state can't possibly afford to reproduce the town's costly fix in up to 50 other small Louisiana towns he hears are also dealing with dirty water.

"Clean water is a human right," he said, but in order to provide it, he thinks current systems of water delivery need to be transformed. Honoré suggested smaller towns'



water systems be consolidated into larger regional systems.

The American Society of Civil Engineers' report card for U.S. infrastructure also suggests systemic change is needed. The society gave the country a D on drinking water infrastructure.

Federal help available to states for upgrading water systems is a drop in the bucket compared to what is needed across the country.

Last year the Environmental Protection Agency (EPA) released an outline of actions to improve the safety and reliability of the nation's drinking water. But with the Trump administration's proposed massive budget cuts for the EPA, it is doubtful the agency will have the money or the will to carry out those plans effectively or enforce key regulations that protect drinking water.

While the EPA announced on January 10 \$1 billion will be available as loans for water infrastructure projects, the agency has estimated that the U.S. needs about \$660 billion in investments for drinking water, wastewater, and stormwater infrastructure improvements over the next 20 years.

For perspective, the United States has one million miles of drinking water infrastructure, and 12 of those miles are now being replaced in St. Joseph.

Until their town's water system is fixed, the Bowmans plan to continue delivering water to those who don't have the means to get it for themselves. Filling up jugs and delivering the water "is a lot of work," Wanda said, but she doesn't want to see the town elders cutting back on their water intake because they are afraid of running out. "No one in America should have to live that way."

Works Cited

Dermansky, J. (2017, March 18). While One Louisiana Town's Lead-Tainted Water System Is Replaced, Dozens of Others Deteriorate. Retrieved from DeSmog: https://www.desmog.com/2017/03/18/st-joseph-louisiana-lead-tainted-water-system-re placed-dozens-deteriorate/



After years with unsafe tap water, St. Joseph residents eager for new system By: Site Administrator Posted at 5:27 PM, May 23, 2017 and last updated 11:24 AM, August 03, 2018

In the last year, the small town of St. Joseph has made international headlines.

Its water system, more than 100 years old, had been rife with rust, leaks and discoloration for decades. But in December, a new problem arose: the water tested positive for lead, a contaminant that causes irreversible brain damage in children.

That's when the state stepped in, allocating more than \$9 million to replace the town's water system. But it's estimated the work won't be complete until September. So how's the city surviving in the meantime?

We heard the stories of three different people who give a glimpse of what it's like living with contaminated water.

'It ain't easy at all'

Meet Ginger Grissom. Her mother opened a salon decades ago along Plank Road, St. Joseph's main drag that leads to the Mississippi River levee. But since her mother passed away earlier this year, Grissom has been working to keep her legacy alive.

But one look at the salon's sink, stained orange with layers of iron, and you'll see why that's become difficult. Grissom says she's lost all her mother's facial business, as her clients don't feel comfortable getting pampered with the discolored water that has now been proven tainted with lead.

The morning before KATC visited Grissom, the salon's water had been orange, she says. But on a good day, the water is cloudy – "but that to us is crystal clear."

One quick web search reveals what the water had been like in its worst days, with countless results showing brown, sometimes sludgy water, the photos coming from residents who have worked for the last year to bring government and media attention to the town's water crisis.

The water can be so full of iron and manganese that when it saturated the salon's water during a recent machine wash, it turned Grissom's white towels beige and purple robes brown — a permanent discoloration that even bleach can't remedy. To avoid such a mishap with a client's hair, Grissom brings gallon jugs filled with water from a neighboring town's system and uses it on her clients.



But for St. Joseph residents to receive water they would normally use from any functioning, quality tap, they rely on another system: drinkable water that's trucked in and disbursed from camouflage-painted, military water-tank trailers placed throughout the town.

Known as "water buffaloes," the 14 tanks are emptied and refilled six days a week, which keeps the water from stagnation, and then it's tested for adequate levels of chlorine to keep the water disinfected. With each buffalo holding 400 gallons of water, around 200,000 gallons of water has been transported to the rural Tensas Parish town over the last six months.

That's equivalent to around 10,000, twenty-ounce water bottles – thousands of which have also been delivered to St. Joseph since the state detected lead throughout the town's system and declared an emergency.

But before the water can be used, it must make one final journey: to the home.

Meet Betty Lee Roberts. To refill her water stores, she walks with a 5-gallon bucket to the nearest buffalo, fills it up and returns home. Her tap water isn't safe for brushing her teeth or washing her food — and certainly not for drinking — and she's a senior who cannot afford a car.

"It ain't easy at all," Roberts says.

Although her grandchildren are sometimes around to help her, she still has to work to keep the young ones away from the construction, with miles of dug-up ditches exposing water and gas pipelines and muddied land.

"When I get back I'm too tired to do anything. I'm wore out," Roberts says.

A project bigger than the town budget Residents say the conditions are tough to deal with. But Mayor Elvadus Fields Jr., 79 years old and in his first year in office, says St. Joseph is "fortunate."

"We are going through change with help," Fields says.

That's because St. Joseph received the financial aid it needed to replace its water system. But with more than \$5 billion in water infrastructure needs throughout the state, it may not be the last to find itself in such a position.



Even with the aid, however, the town is far from flush with cash. The more than \$9 million construction costs eclipse the town's \$7.6 million annual budget, and the town's finances have been taken over by the state.

Finances and records had been in such disarray under St. Joseph's previous, 16-year administration that it could not complete an audit for years, preventing the town from receiving grants that could have prevented the water crisis. The state appointment of a fiscal administrator to get things back on track.

Today, there's not an existing map of where the town's underground gas pipes are laid, which has added to the harms in St. Joseph. While KATC visited the town, we smelled three gas leaks at construction sites throughout the town.

Although the gas-line breaks are caused by the construction, it's the town's responsibility to repair the damage, Fields says. With only five town maintenance employees — only two of whom are trained to repair leaks in gas lines, according to fiscal administrator David Greer — the gas leaked into the air, unchecked and feet from occupied homes, for days.

If construction is completed in September, the next step for St. Joseph residents may be to replace water pipes in their individual homes. Residents will have to pay for those repairs themselves, but in the town — where nearly 40 percent of the less than 1,200 residents live below the poverty line — that may prove problematic.

Works Cited

KATC . (2017, May 23). After years with unsafe tap water, St. Joseph residents eager for new system. Retrieved from KATC:

https://www.katc.com/news/2017/05/23/after-years-with-unsafe-tap-water-st-joseph-r esidents-eager-for-new-system/



St. Joseph's New Water System Goes Online

By Nick Picht Published: March 13, 2018 at 6:48 PM CDT

For the first time in years, St. Joseph's water is safe to drink.

On Tuesday, Louisiana Governor John Bel Edwards unveiled the town's new \$9 million water distribution system, paid for by the state's Capital Outlay Program and the Delta Regional Authority.

"This is a big day for this community," Edwards said.

A big day after 18 months worth of work. In December 2016, Edwards called a public health emergency when the Louisiana Department of Health found lead in the old system. The National Guard and volunteers spent months passing out bottled water.

St. Joseph's Mayor Elvadus Fields says all the hard work has finally paid off.

"(This is) one of the best days of my life, and certainly one of the best days for us here in St. Joseph," said Fields.

But, not everybody is celebrating just yet.

"I'd say bittersweet," said Ruby Shorts, a St. Joseph resident. "It's not a good day. It's not a bad day. It's an in-between day."

Some people like Shorts are still having problems in their homes. Her washing machine still fills up with discolored water. Her bedroom carpet is ripped up after she says the new system's high water pressure broke a pipe in her bathroom.

"I put my feet down on the carpet, and my feet went straight down in the water, she said. "I was wondering what happened."

And Shorts isn't alone, DHH says there are still some homes that show high lead levels.

"There's only about six that are remaining that have a little lead that's above the level," State Health Officer Jimmy Guidry said. "But, all the others are below the acceptable level. And we will continue to work with those that have slightly elevated [levels], and that should get better with all this treatment."

It could take a while before the whole town is lead-free. But, in the meantime, many people are finally starting to trust the faucet again.



"It's a game changer, our water is clean. Like, we can drink out of the faucet. It's different," Tensas Parish High School student Justin Leonard said.

Works Cited

Picht, N. (2018, March 13). St. Joseph's new water system goes online. Retrieved from KNOE:

https://www.knoe.com/content/news/St-Joseph-water-system-goes-online-476746333.h tml

St. Joseph: English Standards



Grade 8	Grade 9-10	Grade 11-12
CCSS-RI.1-8	CCSS-RI.1-9.10	CCS-RI.1-11.12
Cite the relevant textual	Cite relevant and thorough	Cite strong, thorough, and
evidence that most strongly	textual evidence to support	relevant textual evidence to
supports an analysis of what	analysis of what the text says	support analysis of what the
the text	explicitly as well as inferences	text says explicitly as well as
says explicitly as well as	drawn from the text.	inferences drawn from the
inferences drawn from the		text, including determining
text.	CC-RI.2-9.10	where the text
	Determine a central idea of a	leaves matters uncertain.
CCSS-RI.2-8	text and analyze its	
Determine a central idea of a	development over the course	CC-RI.2-11.12
text and analyze its	of the text,	Determine two or more centro
development over the course	including how it emerges and	ideas of a text and analyze
of the text,	is shaped and refined by	their development over the
including its relationship to	specific details; provide an	course of the text, including
supporting ideas; provide an	objective	how they interact and build o
objective summary of the text.	summary of the text.	one another to provide a
		complex analysis; provide an
CCSS-RI.6-8	CCSS-RI.6-9.10	objective summary of the tex
Determine an author's point of	Determine an author's point of	
view or purpose in a text and	view or purpose in a text and	CCSS-RI.6-11.12
analyze how the author	analyze how an author uses	Determine an author's point of
acknowledges and responds to	rhetoric to advance that point	view or purpose in a text in
conflicting evidence or	of view or purpose.	which the rhetoric is
viewpoints.		considered particularly
		effective, analyzing how style
		and content contribute to the
		student interpretation of
		power, persuasiveness, or
		beauty of the text.

St. Joseph: Social Studies Standards



Civics	World History	World Geography
C.9 Analyze the structure, roles, responsibilities, powers, and functions of government in the United States. C.11 Analyze political processes and the role of public participation in the United States.	 WH.6 Evaluate the influence of science, technology, innovations, and explain how these developments have altered societies in the world from 1300 to 2010. WH.22 Analyze trends of increasing economic interdependence and interconnectedness in world history from 1300 to 2010. WH.24 Analyze the effect that humans have had on the environment in terms of resources, migration patterns, and global environmental issues. 	WG.7 Analyze how governments and political boundaries affect people and places.



St. Joseph: Science Standards

Grade 8	Earth Science	Life Science	Environmental Science
8-MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing human impact on the environment.	HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.	HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.	HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.