

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)	<b>Region 3</b> (Vernon, Natchitoches, Winn, Grant, Rapides, Cladwell, La Salle, Avoyelles, Catahoula, Franklin, Concordia)	
Grand Bois	<b>Region 5</b> (Evangeline, St. Landy, Acadia, Lafayette, Vermillion, St. Martin, Iberia, St. Mary, Assumption, Terrebonne, Lafourche)	
Homer	<b>Region 1</b> (Caddo, Bossier, Webster, Claiborne, De Soto, Bienville, Red River, Sabine)	
Mossville	<b>Region 4</b> (Beauregard, Allen, Jefferson Davis, Calcasieu, Cameron)	
St. Joseph	<b>Region 2</b> (Lincoln, Union, Jackson, Ouachita, Morehouse, Richland, West Carroll, East Carroll, Madison, Tensas)	
Mandeville	<b>Region 7</b> (East Feliciana, Livingston, St. Helena, St. Tammany, Tangipahoa, Washington, West Feliciana)	



### Mandeville



#### LEAN Region 7

Louisiana's Florida parishes including the "North Shore" in southeast Louisiana:

- East Feliciana Parish
- Livingston Parish
- St. Helena Parish
- St. Tammany Parish
- Tangipahoa Parish
- Washington Parish
- West Feliciana Parish

#### **About Mandeville:**

The northern shore of Lake Pontchartrain is a lush landscape filled with rivers, bayous and forested lands, having long been inhabited by indigenous tribes. In more modern times, the 'northshore' and St Tammany Parish have seen the growth of communities including Mandeville, Abita Springs, and Covington known for their beautiful environment. In 2014, Helis Oil Co. requested a permit to drill an exploratory well for natural gas northeast of Mandeville. Local residents concerned about potential impacts and expanding industrialization of the area formed an organization, Concerned Citizens of St Tammany, to challenge the permit. Particular concern arose from the company's plans to utilize hydraulic fracturing, or 'fracking'. After 2 years of hearings, public meetings, legal challenges and debate, Helis Oil abandoned its plans to develop the site.

#### Standards:

English Social Studies Science



Resource	Description
With Fracking Threatening Its Sole Drinking Water Source, A Coastal Community Fights Back <u>Source</u>	A Think Progress article detailing the unprecedented opposition from St. Tammany Parish residents against the proposed drill site by Helis.
Helis to be a no-show at fracking meeting on Northshore <u>Source</u>	A WDSU article about Helis' decision to not attend a public meeting regarding their proposed drilling site.
Excerpt from Permit Documents for the Department of Natural Resources (PDF)	Email correspondence between Lisa Jordan, Deputy Director of the Tulane Environmental Law Clinic and Patrick Courreges, Communications Director of LA Department of Natural Resources. Ms. Jordan is clarifying information regarding public commentary during an upcoming public meeting about the Helis drill site.
Helis stops fracking project on North Shore <u>Source</u>	Article from New Orleans City Business.
Drilling/fracking project in St. Tammany receives support of Northshore Business Council <u>Source</u>	Article from NOLA.com.
Helis told to stop work on well for fracking project	WDSU news segment.
St. Tammany Parish Council putting up money to continue fracking fight	WDSU news segment.

#### **Extended Reading Activity:**

Read With Fracking Threatening Its Sole Drinking Water Source, A Coastal Community Fights Back, watch Helis told to stop work on well for fracking project 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.





# With Fracking Threatening Its Sole Drinking Water Source, A Coastal Community Fights Back

Alice Miranda Ollstein January 26, 2015

ABITA SPRINGS, LOUISIANA – Since its founding as a Native American trading village, Abita Springs has staked its reputation on its clean air and pure waters. Princess Abita of the Choctaw tribe, as the local legend goes, was wasting away in filthy New Orleans in the 1780s until she traveled north and drank from the healing spring that gave the town its name.

A few hundred years later, Abita Brewery set up shop in town because of the "pristine" aquifer water it now uses in its internationally popular beers. "The sage, clean environment has always been very, very important to Abita Springs," said the town's mayor Greg Lemons. "The quality of life is high here."

But now, residents fear the pristine aquifer, the sole source of drinking water for miles, could be under threat of contamination as a fossil fuel company eyes the oil and gas deposits below.

In December, over the objections of Mayor Lemons and many arish residents, Louisiana's Department of Natural Resources approved a permit for the corporation Helis Oil & Gas to drill an exploratory well two and a half miles deep in the wooded wetlands just outside Abita Springs. If they find the fossil fuels they're looking for, the company plans to extract it through the controversial process of hydraulic fracturing, known commonly as fracking.

As Louisiana residents watch their coastal wetlands disintegrate, a process exacerbated by oil and gas extraction, leaving communities to allow more oil and gas exploration in those very wetlands.

The proposed project near Abita Springs not only threatens to contaminate the sole drinking water source of the town and its surrounding communities, but it comes at a time when the state is wrestling with questions of corporate accountability, home rule, and the ecological and social consequences of rapid wetland loss.

Though Helis still needs a water quality certification from the state Department of Environmental Quality before they can begin drilling, they have already leased 68,000 acres from local wealthy landowner Edward Poitevent – all of it sitting atop the possibly fossil fuel-rich Tuscaloosa Marine Shale deposit that stretches across Louisiana and its neighboring states. The company would also have to overcome the local parish's zoning laws, which currently do not allow for any heavy industrial activity in the area, and



emerge victorious from a number of lawsuits filed by surrounding communities who would be impacted by a fracking boom.

Then there are the residents of St. Tammany Parish, who say they're not going down without a fight.

Sandra Slifer, President of the League of Women Voters of Louisiana and a co-founder of the grassroots group Tammany Together, said that she has never seen such a strong mobilization in her conservative parish. "I can't remember another time when hundreds of people came to a public meeting and sat on bleachers in a school gymnasium for four and a half hours, at least, before they had a chance to speak," she said. "People stayed until 12:30 in the morning."

In the spring, concerned residents began approaching local businesses one by one, presenting them with scientific information about the dangers of fracking and urging them to put up signs of opposition in their windows. Despite some initial reluctance, especially considering the Northshore Business Council and the West St. Tammany Chamber of Commerce support the drilling bid, dozens of bars, cafes, and stores agreed.

"It's never easy for businesses in a state like Louisiana to step up and go against the status quo," Slifer said. "We have a hundred-plus-year history of being dominated by oil and gas interests, so it takes a lot of courage for businesses to make a public statement against the industry."

Patrick Courreges, the Communications Director of the Department of Natural Resources, said this level of local opposition to a drilling permit is unprecedented. His office churns out between 1,500 and 2,000 oil and gas drilling permits a year, and as far as he can remember, no community has demanded public hearings of been as engaged as St. Tammany.

"Oil and gas production has been going on for more than a century in Louisiana," he said. "Most of the time, a company files a permit, it's reviewed, checked and they go forward. But this is an area where folks are not used to it, so it's kind of a culture shock for them."

Slifer partly credits this mobilization to the state Department of Natural Resources' decision to grant the fracking permit in violation of the town's local zoning laws, which designate the site in question as residential. "The St. Tammany government worked on zoning for decades, with lots of input and time and energy from residents," she said. "So to see the state come in and say, 'It doesn't matter, we know what's best for you,' it makes a mockery of the community."



Concerned Citizens of St. Tammany member Terri Lewis Stevens, who lives in neighboring Covington, says her group officially intervened in the zoning lawsuit out of concern that giving the state a trump card could set a dangerous precedent. "if this is allowed, fracking could be next to a schoolhouse, a courthouse, a nursey, or anywhere," she said.

Slifer and other anti-fracking advocates said while they are focused on defeating Helis' current proposal, their eventual aim is a ban on fracking in the parish. To move toward this goal, they invited activists from Denton, Texas, who recently passed a fracking ban that they are now defending in court, to share ideas and tactics for pursuing such efforts in a fossil-fuel-friendly state.

"We're both in the heart of oil and gas in Texas and Louisiana, and this is an opportunity for activists to compare notes," she said. "What triggered the reaction in the residents to say 'No more.' How did they bring together divergent groups of people, including government? What worked? What didn't work How did they get to the point where they were able to have an election in a town – I don't want to say dominated, but influenced by oil and gas?"

As St. Tammany residents continue their outreach and organizing efforts, what may ultimately derail Helis' plans is the requirements of a wetland permit from the Army Corps of Engineers – a federal entity residents believe is much less inclined to side with oil and gas interests than Louisiana's agencies.

"The Department of Natural Resources, the Office of Conservation, and the Department of Environmental Quality are captive agencies," St. Tammany resident Mike Stagg wrote in an email. "They view their primary duty as serving the interests of the industries that most citizens (perhaps naively) expect to protect our interests."

The permit issued by the Department of Natural Resources last month does come with some restrictions. For example, Helis would have to use privately owned ponds for holding their fracking wastewater, and those ponds could not be fed by groundwater. Helis would also have to disclose all the chemicals it uses to frack – a move not usuallyrequired thanks to a gap in federal law commonly known as the Halliburton loophole, which designates such chemical mixes as protected trade secrets. The permit also sets out a long list of requirements for monitoring groundwater, air, storm water and noise levels and for making that information public.

In justifying its decision to grant the exploratory drilling permit, the state agency argued that there are already more than 1,000 oil and gas wells already drilled through the Southern Hills Aquifer. "The chosen well site is at an optimum location to efficiently and economically drain the unit and to minimize the environmental impact and disruption or



inconvenience to the public," the agency wrote.

Courreges with the Department of Natural Resources added that Helis Oil and Gas is "in good standing" with the state, and their record of previous drilling projects includes only "some housekeeping issues" but "no major environmental problems."

This is not enough to allay the concerns of local residents like Stephanie Gray, a Louisiana State University professor who lives in the town of Covington in St. Tammany Parish.

"We're concerned about damage to the natural environment," she said. "We're concerned about truck traffic, increases in accidents. And this particular drill site is about a mile away from a high school, so there aren't only small towns being impacted, but a lot of subdivisions, businesses and kids, too."

The Department of Natural Resources' drilling permit assures residents that Helis' plan "uses the best available and safest technology," and notes, "any potential risks of corrosion will only occur long after the hydraulic fracturing has occurred."

That's exactly what Mayor Lemons, who is currently suing to maintain the area under residential zoning, is worried about.

"Those wells will still be there in 50 or 70 years," he said. "If [the casing] fails, it's a big failure, not a little one. People die. Animals die. Properties are ruined. A lot of these chemicals are carcinogens that have a long term effect, and those very bad chemicals in the ground will eventually come up."

According to a recent study by the Lake Pontchartrain Basin Foundation, the proposed fracking exploration threatens the "sole potable water source" for St. Tammany Parish, which provides water to at least a quarter of a million people. The study concludes that "failure of a single well may equate to loss of the water supply to local communities. In general, remediation of contaminated aquifers is difficult or impossible. Loss of the water supply could jeopardize the very existence of the community."

The Foundation also notes that the fracking project would impact several "endangered, rare, and threatened" species, including the rainbow snake, the long tailed weasel, and several types of turtles, tortoises, frogs and birds.

In its permit, the state Department of Natural Resources dismissed these arguments out of hand, saying, "those in opposition to the permit have presented no credible information or scientific studies in support of their position."



In November, the federal Environmental Protection Agency publicly urged the Army Corps of Engineers to reject Helis' bid for a permit, writing: "The jurisdictional wetlands that would be impacted by this project not only provide wildlife habitat, but also perform valuable water quality maintenance functions by removing excess nutrients and pollutants from the water. They also provide flood water storage. As you are aware, wetland areas such as those proposed to be impacted have experienced a tremendous decline in Louisiana."

The Army Corps of Engineers has also noted that Helis has failed to prove they considered non-wetland areas for drilling and have not demonstrated any plans to minimize damage should they get the go-ahead to begin fracking.

In statements posted on its website, Helis has brushed aside these concerns, telling the public that "this project will be highly regulated and well-supervised" and claiming "there is no risk of contamination to the aquifer."

Stop a random Louisianian on the street, and there's a good chance he or she has a connection to the oil and gas industry. Those leading the charge against fracking in St. Tammany Parish are no different.

Staggs, a Louisiana native who now organizes for environmental public policy, described his time "in the oilfield as a roustabout and roughneck both onshore and off, as well as working for a while for Halliburton when it was still an oilfield service company."

Mayor Lemons also worked in the oil fields during college and high school, mostly on rigs "where you drill down into a big pool of oil offshore." He cited this experience to emphasize that he's not "anti-drilling" or a "running-through-the-woods environmentalist."

"There's a lot of good in oil drilling. The need for energy, I understand that. I'm a practical person. I drive a car and I like it," he said. "But there's a lot bad about it too, some very large environmental issues. You've got to strike a balance, and find the right time and right place, and out there is not the right place."

The mayor added that thanks in part to state laws that give massive tax breaks and incentives for fracking projects, the local community would see little to no financial benefit.

"Most of the equipment is not bought here. Most of the people they'd bring in to do the work are not employed here—they're coming in from contract companies. They set up temporary huts, shelters, so they're not renting," Lemons said. "So we get potential



polluting of our aquifer, the potential polluting of our air, groundwater pollution, quite a bit of noise pollution, right on our doorstep, and no money coming into Abita Springs. "

Louisiana's tax incentive for horizontal drilling and hydraulic fracturing was passed nearly two decades ago, when the process was still an experimental and risky venture. But now that the controversial technology is widely used, with more than a thousand fracking wells already in production and hundreds more on the way, the waived severance tax is starting to add up. An analysis by The Advocate found that the state has lost more than a billion dollars of revenue in just the past few years, leading groups like the Louisiana Budget Project to blast the tax break and call for its repeal.

For now, residents will continue petitioning the Army Corps of Engineers to reject Helis' application for a wetland permit and urging the overwhelmingly Republican St. Tammany Parish Council to keep funding its lawsuit against the state for the right to control its own zoning. Arguments in that case were scheduled for early February in Baton Rouge, but could be delayed further.

St. Tammany resident Margie Vicknair said despite Louisiana's record of deference to oil and gas companies, Louisiana environmentalists will continue to fight such projects when and where they are proposed.

"We are so often written off by others as if we've all given up and gone off to party on Bourbon Street," she said. "We are fighters, though. Our ancestors wouldn't have lasted through all the muck and mosquitoes and malaria if they hadn't been fighters. We want to save this place because for us it is a place of peace and beauty."

#### **Works Cited**

Ollstein, A. M. (2015, January 26). With Fracking Threatening Its Sole Drinking Water Source, A Coastal Community Fights Back. Retrieved from Think Progress: https://archive.thinkprogress.org/with-fracking-threatening-its-sole-drinking-water-sou rce-a-coastal-community-fights-back-eef4f322f538/



#### Helis to be a no-show at fracking meeting on Northshore

Heath Allen May 12, 2014

**St. Tammany Parish, La.** – The heated plan to build a fracking well in St. Tammany Parish is expected to draw another big crowd at a public meeting Monday night.

However, the company hoping to drill the well has turned down an invitation to appear and answer questions.

St. Tammany Parish Councilman Jake Groby said Monday night's meeting is going to be a "beat-up session."

"I wasn't going. I'm not going to all that," he said.

Helis Oil & Gas is seeking permits to drill a test well between Mandeville and Abita Springs, using the controversial fracking – or hydraulic fracking – technique.

Fracking is the technique in which water, chemicals and sand are pumped into the ground to open the avenues to remove gas and oil.

David Kerstein, Helis' resident, was invited to attend and answer questions. He declined.

"They have, I think, seen the other meetings that have taken place, and I think they have sent all the information. They've sent every bit of information to me that I've asked for. I think they are just not comfortable in this setting of that type of meeting," said St. Tammany Parish President Pat Brister.

"The public would like to know how the process is going to be done, and I can't think of anybody better than Helis to explain it," said Groby.

As that meeting prepares to move forward, state Rep. Tim Burns is pushing legislation that would provide more time for parishes to her public input.

"It allows more local control over it," Burns said. "It'll allow local zoning to control it a bit more to give communities somewhat of a say in how this activity is done."

Burn's bill was defeated Monday.

Brister notes that Louisiana is an oil and gas state and the state has control of the process.



"I don't think they will give up easily, no," Brister said.

By mutual agreement, most everything is on hold until next month, allowing all involved to state cases clearly and understand what's going on. However, Groby said that now is a good time to answer the public's questions.

"Whether it's at that meeting or it's another meeting, what kind of venue is it that you cannot simply tell the public what it is you are trying to do? That's only fair," Groby said.

Residents in St. Tammany have a number of issues – not the least of which are property values and the safety of drinking water.

Monday night's meeting is open to the public and begins at 6:30 pm at the Castine Center, in Pelican Park.

#### Works Cited

Allen, H. (2014, May 12). Helis to be a no-show at fracking meeting on Northshore. Retrieved from WDSU News:

https://www.wdsu.com/article/helis-to-be-a-no-show-at-fracking-meeting-on-northshor e/3370693#





#### Helis stops fracking project on North Shore

CityBusiness Staff Reports September 20, 2016

Helis Oil & Gas Co. is ending its controversial fracking project in St. Tammany Parish after determining it's not commercially viable.

The company announced Tuesday that it will not advance to the second phase of the project on its exploratory well northeast of Mandeville. The decision comes after a review of geologic, engineering and other data.

"Helis has determined that the prospect lacks appropriate commercial viability so the company will not pursue the project any further. Helis intends to permanently abandon the well and secure the site in accordance with regulatory requirements and its leases," said Greg Beuerman, Helis spokesman.

The company has suspended the air, water quality and noise monitoring that it instituted before beginning work on the site, the news release said. The results of that monitoring will still be available to the public through the Louisiana Office of Conservation.

If the exploratory drilling had shown more promise, Helis would now be working with regulating agencies, parish officials and contractors to move the project toward completion and production late this fall, officials said. At the beginning of the project, Helis estimated the potential for commercial success at 30 percent to 35 percent.

#### **Works Cited**

CityBusiness. (2016, September 20). Helis stops fracking project on North Shore. Retrieved from CityBusiness:

https://neworleanscitybusiness.com/blog/2016/09/20/helis-stops-fracking-project-on-n orth-shore/





#### Drilling/fracking project in St. Tammany receives support of Northshore Business Council

Robert Rhoden Updated July 19, 2019

Helis Oil's proposed drilling and fracking project near Mandeville has picked up the support of the Northshore Business Council, and organization made up of business leaders in St. Tammany, Tangipahoa and Washington parishes. The organization twice issued news releases since late July touting its general support of the oil and gas industry and the economic benefits it provides to the local area and state, but didn't specifically say that it was backing Helis' project.

Asked about its position, council Executive Director Larry Rase said Helis' proposal has the organization's "full support" because of the economic gains it could bring to the area and because the business group feels the drilling can be done safely.

Fracking – the process in which water, sand and chemicals are pumped deep into the earth at high pressure to fracture rock and release oil and gas for extraction – has been around for decades without ruining any aquifers, Rase said. "I think it will be very safe, especially as far as the health and safety of the aquifer."

Rase said the business council studied the issue, did polling and consulted experts before making any statements. "That's what everybody else should have been doing ... before getting into these lynch mob meetings," he said, referring to public meetings that have drawn large crowds of fracking opponents who point to problems it has caused elsewhere in the U.S.

While opponents of the project have been very vocal and visible, Rase said, they likely represent a small percent of St. Tammany Parish's approximately 240,000 residents.

He called the St. Tammany Parish Council's lawsuit seeking to block the Helis project a waste of taxpayer dollars. "They did it because they were on the run" facing groups of citizens demanding action. "They had to do something."

The group Concerned Citizens of St. Tammany took issue with NBC's position on the Helis project. In a recent news release, it said, "The NBC is nothing more than a trade association - a mouthpiece for business interests, whose very existence is dependent on the good will and financial support of business."

If allowed, the Helis project would ultimately lead to "thousands of wells drilled across the western section of St. Tammany Parish, pollution of the parish's clean air and water, rapid, unmanageable, and ravishing industrialization of the parish's suburban and



pastoral landscape, and permanent ruin of the parish's social and cultural heritage," Concerned Citizens said in a statement.

Rase called the group's response "over the top," "inflammatory" and "amazingly incorrect."

The Business Council says it is made up of 50 presidents, CEO's and market managers on the north shore.

The St. Tammany West Chamber of Commerce has not taken a formal position on the project, for which Helis is seeking a state drilling permit, an Army Corps of Engineers wetlands permit and a state water quality certification.

"Our board is reviewing input and requests that have been received regarding our support of the project and we will be responding after that review," said Lacey Toledano, president and chief excecutive officer of the St. Tammany West Chamber of Commerce.

The East St. Tammany Chamber will not be taking a formal position on the project, Chief Executive Officer Dawn Sharpe-Brackett said.

(This story was updated on Oct. 21 to include the position of the East St. Tammany Chamber.)

#### **Works Cited**

Rhoden, R. (2019, July 19). Drilling/fracking project in St. Tammany receives support of Northshore Business Council. Retrieved from NOLA.com:

https://www.nola.com/news/politics/drilling-fracking-project-in-st-tammany-receives-s upport-of-northshore-business-council/article\_8e5e0862-e59a-5c33-94ea-908835c63956. amp.html

### Mandeville: English Standards



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

#### Mandeville: Social Studies Standards



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



#### **Mandeville: Science Standards**

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