Collective Action Addressing Climate Change and Poor Air Quality in Houston
(11th grade, air quality project)

Project Summary	
Teacher Name: Lisa Gianukos	**Email:** lisagianukos@celfeducation.org
School: Energy Institute High School	**District:** Houston Independent School District
Grade Level: 11th Grade **Subject Area:** Interdisciplinary - US History, Environmental Science, Engineering, English	**Brief Project Overview:** Students choose a solution to address climate change, then groups propose their idea to the school campus, City of Houston City Council, and/or HISD Trustees (based upon the scope of their idea). Students use their research and writing skills to record a podcast. Students share with audience members their podcast and survey (to assess the effectiveness of audience understanding of information)
Project Name: Collective Action Addressing Climate Change & Poor Air Quality in Houston	
Project Timeframe: 4 weeks/20 contact days	**Final Student Product:** Students create podcasts addressing HTX climate change & air quality aired on Houston Public Media through the University of Houston AND each group creates independent websites through Weebly where they post their Podcasts along with a survey assessing listener knowledge *following* the review of the Podcast information (measuring listener growth).

Big Ideas of Sustainability
The Big Ideas of Sustainability ● **Place** ● **Community** ● **Change over time** ● **Long term effects**

Overarching Standards & Student Outcomes
Overarching Standards: Interdisciplinary Themes ● **US History** - The history of fossil fuels and its economic impact on American history; study collective action case studies. ● **Environmental Science** - Climate vs. Weather (note: check for understanding), Sources & Effects of poor air quality, Define Climate Change (4 Key Concepts must be included in different sections of the podcast) ● **Engineering** - Byproducts of liquid fuel combustion, pros/cons of biodiesel vs fossil fuels for local air quality & global climate (greenhouse gases), production of biodiesel (transesterification), selection of oil type (soy, algae,

sunflower, straight, waste, etc.) based on availability & quality (titration number)
- **English - Formal presentation skills (sound, professional, on time), ability to articulate an argument, collect and analyze data, quality of logical connections between ideas in podcast, editing and sequencing and sound to**
- **reflect social and cultural views and distinct point of views, delineation of plan to impact, Houston positively based on directly or indirectly replacing fossil fuels**

Student Outcomes:
- **Students will understand climate change.**
- **Students will understand the effects climate change has on citizens at a local level.**
- **Students will address climate change at a city, district, and campus level.**
- **Students will collaborate with city and district stakeholders to find solutions.**
- **Students will use collective action and observations to produce podcasts.**

Students will apply these Big Ideas by knowing the following:
- **Students will <u>know</u> the cause of climate change & poor air quality in the Houston region.**
- **Students will <u>know</u> the air quality changes over time.**
- **Students will <u>value</u> research findings and industry expert information.**
- **Students will <u>value</u> thinking in the future and considering long-term effects.**
- **Students will <u>be able to create</u> Podcasts to air through Houston Public Media.**

Driving Questions

Driving Question: How can we, as residents of Houston, use collective action to address climate change & poor air quality by producing podcasts highlighting research-based solutions?

Entry Event

Entry Event: Guest Speaker - Edel Howlin from Houston Public Media presented Podcasts 101
Community Connection Needs: University of Houston professors, City of Houston, Air Alliance organization

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Knows & Needs-To-Knows
(Assessing through Student Voice)

Knows: 1) Students know differences between renewable and non-renewable sources of energy; 2) students know how to create biofuels; 3) students know the life cycle of energy sources (including hazardous waste/landfills & mining materials); 4) students know effective writing styles including writing for research vs. writing for persuasion, and 5) students understand the importance of collective action and local government.

Need to Knows (NTK): 1) how to address climate change; 2) ways to improve air quality; 3) the sources of air quality pollutants; 4) the effects of air quality pollutants on human health, the local economy, and the environment; and 5) what makes an effective Podcast.

Teacher Reflections: Make sure the rubric assesses the students NTK list in order to measure student growth.

Student Product

[Podcast Final Product](#) aired on Houston Public Media through the University of Houston AND each group creates independent websites through Weebly where they post their Podcasts along with a survey assessing listener knowledge *following* the review of the Podcast information (assessing listener growth).

Community Events for Project

Students present their Podcast findings at HISD Board Meeting, HTX City Council meeting, Energy Institute HS campus assembly, on-campus teacher learning community, and corporate donors (Exxon Mobil).

Feedback & Differentiation

Teacher Reflection: What does student feedback look like in your teaching practice?
My preferred style of providing student feedback is to hold small group sessions. Whenever I work with small groups, I am able to go through gentle student assessments. The History, Environ. Science, and Engineering teachers also hold small group sessions to check for understanding and clarity.

Identify: How many formative feedback checkpoints will be included in this project?
There are four formative feedback checkpoints for each group as all four content teachers lead each group through small group instruction connected to the development of the podcasts.

Differentiation Scaffolds: [Student Group Contracts Clearly Indicates Purpose and Roles](#)
There is a lot of student voice/choice in this project. Students have the choice to pick their teammates in the groups (3-4), the area of focus, the presentation event, and the podcast model sample shared by Edel Howlin. All students are encouraged to use text to speech for note taking, find inspiration from their favorite Podcasts, and request additional time with teachers for small group instruction (3x weekly).

Research & Sustained Inquiry

Research List Ideas for Students:
At the start of the project, students have an opportunity to confer (either in-person or virtually) with UH professors who work with students as thought partners and guide students to *where* they should research.

Sustained Inquiry Activities: Small group inclusion, [peer-collaboration grade](#), mini-lessons, community-member feedback, workshops, explicit teacher modeling, digital exit tickets, and temperature checks on DQ & K/NTK.

Peer-Feedback

Identify: Which whole class activity will you use to offer students with peer-collaboration?
The whole class goes through a round of [Critical Friends](#) in the middle of the project - right before groups begin recording the Podcasts - to offer product refinement prior to the construct of the final product. Another peer-collaboration mechanism is to have student groups present through [FlipGrid](#) and peers review/reply.

Reflection

Teacher Reflections: The students receive several layers of feedback to reflect upon: 1) all four content teachers; 2) community-member feedback from a campus stakeholder - student choice; 3) UH professor who guided in research; and, 4) Critical Friends Rubrics.

Student Reflection Practice: Students completed daily quick writes for 5 minutes. This sacred writing time allows students to reflect on the progress of their project, Podcasts, research, interviews, organizing, etc.