Final Curriculum Project

**Intro:** For our Curriculum Project we want to lead the class in a lesson with the goal of increasing students’ knowledge about greenhouse gases. The curriculum would be for sixth graders, focusing on the the concepts of clean energy and the reduction of greenhouse gases. The main goal is to make students more aware about the problems on the planet they live on as well as help other students around them. Over this five-day period, students will use hands on learning, go on a field trip, have class discussions, and have a culminating project to help them understand the effects of greenhouse gases.

**Context:** The context for our curriculum project would be a sixth grade science class at the Hartford Magnet Trinity College Academy. This unit will last five consecutive days during five 80-minute class periods. HMTCA is a school that prides itself on having small groups of kids work in many different ways to discuss, explore, and conquer a variety of problems in the classroom. The students will be sitting in pods of four. These pods are facing the front of the room where the teacher is. It is important that students are grouped together so they can not only learn from the teacher, but can learn from each other. Much of this unit emphasizes students working together and having intelligent conversations so if the students are already grouped, it will encourage discussion and will not have to waste class time having the students form new groups. We decided that the
teacher should break the students up in seating so that they are sitting with kids who they can work with without getting distracted. The teacher should split up the students who have a hard time paying attention. The way the students learn varies from simple five minute do-now worksheets to individual projects about green house gases in the United States. This shows that students are capable of learning in all sorts of different ways.

**Objectives:** The main objective of our curriculum project is for sixth grade students at HMTCA to understand the negative consequences of green house gases and learn some alternative ways to produce clean energy. The objectives are as follows:

- Students will understand how and why green house gases are produced. This will give the students background on the causes of green house gases, so they will later be able to research how to prevent them.

- Students will analyze the impact of green house gases on the environment. Learning about the effect of green house gases will give the students an understanding of the harms they cause and show them why it is important to help reduce them. This aligns with the Next Generation Science Standard because throughout the lab, students will be recording the temperature changes and collecting the data, showing the changes in the weather.

- Students will decide how to raise awareness at the school about greenhouse gases by a poster campaign. This is important because they will not only be sharing what they have learned with their classmates, they will be spreading the word and offering clean energy solutions.
These objectives align with Next Generation Science Standards through Cause and Effect (MS-ESS2-5). This standard, MS-ESS2-5, enforces that students who demonstrate understanding can collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. Through the lab, the students will watch and record the changes they see, viewing the results first hand. Also, at their field trip to the Connecticut Science Center, the Energy City exhibit will show the students how pollution is created and how they can help prevent and reduce the toxins. They will record their findings.

**Activities:** On day one, the students will be working on the lab for the majority of the time. The lab was found online but is a pretty common lab. The lab is called Global Warming in a Jar. The lab takes about 30 to 45 minutes of time and the end result shows three different jars filled with green house gases so that students can get a sense of how it works. Each group of two or three students will have three jars. Each jar has a thermometer to measure temperature change. Jar #1 is the control experiment. It is left uncovered. Jar #2 is covered to show on a small scale how greenhouse gases get trapped in the atmosphere and result in temperature change. Finally, Jar #3 is covered and partially filled with water to show/represent temperature change in the atmosphere near a body of water. The teacher will open the class having a few people share their thoughts about greenhouse gases and then begin to introduce the lab itself. Once the lab is introduced, the groups will grab the materials and get to work. The students will be working on the lab and the teacher will float around the classroom answering possible questions. Students
will work their way through the lab and take observations. The observations will be recorded on a work sheet that has target questions created by the teacher.

The homework for that night is to get a permission slip signed for a field trip on Wednesday and to bring in a two to three sentence statement on what each student thought they observed in the lab that day based off the observations they took.

On the second day, student will watch a video/videos about how green house gases are produced. The teacher will help to give background by reviewing the video and discussing the lab from day one. The video is a pretty basic Youtube video that does a simple but solid way of showing how greenhouse gases are developed. The video is eight minutes in length and is sixth grader friendly. The teacher can use pictures either from a textbook or found online to show how the gases work as well. We have attached two pictures that we think would be helpful for students to look at and the teacher to explain. The class will be asked some target questions that are reviewing the video. The questions will look like:

- What does the video point out about green house gases? How can we reduce green house gases?
- Describe the process of how green house gases are created?
- How is the lab report from the previous day and the information we learned from today similar?
- The students will be sitting in their pods trying to answer the questions in small groups.

After a short amount of time, the teacher will ask the students to share the best ideas the group had into a larger discussion with the whole class. The large discussion will be run by the teacher.
The homework for that night will be to bring in a note pad and paper with the signed permission slip for tomorrow. The students are required to turn in the permission slip for the field trip. If a student fails to get his or her permission slip signed, the student will have to research and answer a variety of questions similar, but not the same as the students who attend the field trip. Some of these questions will include:

- Research three different types of clean energy.
- What is a carbon footprint?
- What is the most efficient light bulb?
- Ask a teacher to describe one way that HMTCA/your school uses clean energy.

On the third day, students will go on a field trip to the Connecticut Science Center, specifically the Energy City exhibit, to learn about clean energy alternatives. To bring to the fourth class, students will fill out a worksheet at the museum that we have created for students to work on. The sheet has a few questions to keep their focus on important pieces of the exhibit. The copy of the questions is attached at the bottom. The teacher will float around with students during the field trip trying to keep them on task. The students will be going around looking at exhibit based on the questions on their sheet. Students should be able to map the paths of electricity through a model of a city, spin a crank to see which types of light bulbs are most efficient, tour the Energy Conservation House and take part in search-and-find activities, and finally calculate your personal carbon footprint. ([https://ctsciencecenter.org/visit/exhibits/energy-city/](https://ctsciencecenter.org/visit/exhibits/energy-city/)) - Link to exhibit.

The homework for the third night will be for the students to finish the worksheet that they were given at the museum and be prepared to use something they learned from
the science center in their poster. The worksheet will be given a grade based on the completion of the assignment.

The fourth day will consist of students working in groups of two to create posters. Students should work on the poster either alone or in groups of two because every student needs to get involved. The poster’s messages will be about promoting clean energy or aiming to reduce greenhouse gases. The students will bring all the information together that they have learned and design a poster that explains their understanding of greenhouse gases and clean energy. The students can use the sheet they filled out at the museum and the information they learned from the discussion about the video to formulate the message of the poster. The teacher will go around the classroom making sure each student is participating equally and offering possible suggestions to each poster. The teacher will show the rubric for the poster before so that students know how important the elements of creativity and the unit information are in the grading process (Rubric attached at bottom). The poster is expected to have a mixture of images and words that can capture the attention of other members of the community in the school. The teacher should show some professionally done posters so that students can be inspired to use a catchy slogan or a creative message. The criteria for the project would be based on posters found online that the teacher would show to students before starting the day four. The posters are used to help students get a sense of what to aim for in creating their own posters.

On the fifth day, the students will finish making their posters. After the students have finished up their last touches on the poster, students will present their posters to the rest of the class. Each student should explain their message behind the poster and explain
their reasoning behind their visuals. The rubric has a small section of the grade that is based on the student’s poster presentation. After each group has presented their poster, the students will hang up their posters in the hallway so that the rest of the community can benefit from their work. The posters will help positively influence the rest of the community as well as give the students something to be proud of.

**Evaluation:** Students will understand how greenhouse gases affect our planet and how clean energy can provide some solutions through all the hands on work and visual learning in our five-day unit. Lab reports and visiting a museum are two great ways for students to be excited to learn about greenhouse gases and clean energy. The way that a teacher is able to gauge whether the students take a lot out of the unit are the days that follow each hands on activities. The lab report is on day one and if the students aren't talking in the discussion on day two than the teacher has a good idea that the students aren't understanding the concept. On days four and five, students are required to make a poster based on the information that they have learned from the museum and previous days in the unit. We setup the unit so that all five days could connect to each other and students would not forget much of the information. The poster is a perfect way for a teacher to tell if the students have retained any information from the week because it requires students to present their knowledge of the unit. The activities are perfect for sixth graders because they are hands on and examples of visual/physical learning. The students will do the museum work sheet for a completion grade but the poster will be graded on a four-part rubric. The rubric measures ability to be creative, exemplify knowledge of the lesson, working with a partner, and taking part in presenting the poster. Our unit is aimed
towards six graders, focusing on hands on learning, visuals, and discussions, to educate six graders on a subject that is so important today. We think this is the grade to start educating students about being eco-friendly.

**Bibliography**

Museum Questions:

Field Trip: Connecticut Science Center

Directions: Please answer the following questions based on what you learned, observed and participated in during our field trip.

1) What type of light bulb is most efficient?

2) Briefly describe the path of electricity through a model of a city. What Hartford buildings do you recognize?

3) What was your personal carbon footprint?

4) Record three findings during your tour of the Energy Conservation House.

5) What are three ways to help conserve energy?

6) What did you enjoy most about the field trip? What activities or exhibits helped you learn the most?
7.) BONUS! Draw some form of clean energy you saw at the museum.

Example of green house gases for the students to view:
Sample poster:
| Rubric: |
| --- | --- | --- | --- |
| Creativity | 1 | 2 | 3 | 4 |
| No pictures/ word | Lacking in either pictures or words | Meets expectations of pictures and words | Above and beyond with pictures and words |
| Incorporation of Current Unit | 1 | 2 | 3 | 4 |
| No understanding of unit displayed | Poster has no message | Meets expectations of unit | Above and beyond incorporating the unit |
| Full Group Participation | 1 | 2 | 3 | 4 |
| Only one person did the work | Only 2 people contributed | Only 3 people contributed | Everyone contributed on the poster |
| Presentation | 1 | 2 | 3 | 4 |
| Did not talk during presentation | Added little to no contribution | Contributed a fair amount and met expectations | Contributed and spoke a lot, enthusiastic about project |