FRESNO STATE
Transportation Institute

LESSON PLAN

MEASURE

TRANSPORTATION AND CLIMATE CHANGE ACTION HOUR

OVERVIEW

DURATION: 45 – 50 MINUTES
CATEGORY: TRANSPORTATION
NUMBER OF STUDENTS: 30 IN EACH SESSION APPROXIMATELY
ENRICHMENT COMPONENTS: D.I.Y., STEAM, TRANSPORTATION, ENGINEERING
QUALITY STANDARDS: CALIFORNIA STANDARDS OF LEARNING

LEARNING OBJECTIVE

TO MAKE STUDENTS UNDERSTAND WHAT CLIMATE CHANGE IS, HOW IT IS OCCURRING, HOW CAN WE PREVENT THINGS FROM HAPPENING, AND WHAT WE HAVE ALREADY DONE TO MAKE THINGS BETTER FOR US HUMANS AND THE ENVIRONMENT. THE LIST OF ASSORTED ITEMS/MATERIALS FOR PERFORMING THE ACTIVITY IS LISTED BELOW BUT NOT RESTRICTED TO IT. TEACHERS CAN KEEP ON IMPROVING OR ADDING TO THE LIST AS PER REQUIREMENT.

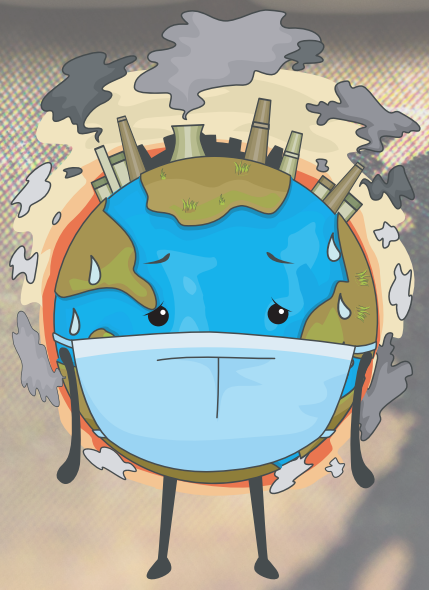
ENGINEERING VOCABULARY

·**Green House Gases (GHG):** The greenhouse effect is caused by a gas that absorbs and emits radiant energy within the thermal infrared spectrum. Water vapor, carbon dioxide, methane, nitrous oxide, and ozone are the principal greenhouse gases in the Earth's atmosphere.

·**Smog:** Smog is a type of air pollution that makes it difficult to see. In the early 1900s, the term "smog" was coined to describe a mixture of smoke and fog. The smoke was mainly caused by coal burning. Smog was frequent in industrial regions and is still seen today in cities. The majority of the pollution we see nowadays is photochemical smog or haze

·**Particulate Matter:** Particulate matter (also known as particle pollution) is a phrase used to describe a mixture of solid particles and liquid droplets found in the air. Dust, grime, soot, and smoke are examples of big or black particles that can be seen with the naked eye.

·**Combustion:** Combustion, often known as burning, is a high-temperature exothermic redox chemical reaction in which a fuel reacts with an oxidant, usually atmospheric oxygen, to generate oxidized, often gaseous products in a mixture known as smoke.



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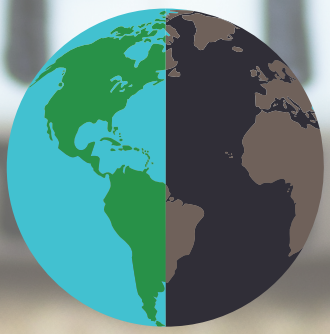
STEPS FOR THE ACTIVITY

1. FSTI team members introduction.
2. Dividing students into equal groups.
3. Pre-Assessment forms distribution.
4. Introduction to pollution and types by discussion (Q&A)
5. Experiment based activities namely:
   - Greenhouse Gas Model
   - Greenhouse Effect Experiment
   - Particulate Matter Incomplete Combustion
   - Smog Test
6. ***All the individual activities can be separately done or combined with each other as per requirement.***
7. Meaning of a sustainable future and how are we going to achieve it. Responsible actions.
8. Giveaways to students.
9. Completion survey and post-assessment for the teachers and students.



DISCUSSION/ENGAGEMENT QUESTIONNAIRE

How many types of Engineering do you know?
What is sustainability?
Why is pollution a problem? What are the impacts of pollution?
What are the different types of pollution?
How is pollution related to transportation?
What is clean energy?
What are the different polluting gasses?
What diseases can be caused by being exposed to pollution?
Suggest some methods to reduce pollution at an individual level?

SOCIAL EMOTIONAL LEARNING

- **Growth Mindset:** Young people believe that they can, through their efforts, grow in their intelligence and abilities.
- **Self-Awareness:** Young people can recognize and understand their identity and feelings.
- **Interpersonal Skills:** Young people use effective communication and collaboration skills to establish and maintain positive and productive relationships.
- **Social Awareness:** Young people have the capacity for empathy, can consider and appreciate the diverse feelings, perspectives, and personal contexts of others.

Credits: - Fresno State Transportation Institute