

# STEAMS National Clean Air Month Project-Based Lesson Plan (7-12)

**Objective:** The objective of this interdisciplinary lesson plan is to raise awareness about air pollution and climate change during National Clean Air Month. Through a STEAMS (Science, Technology, Engineering, Arts, Mathematics, and Social Studies) approach, students will explore the science behind air pollution and its connection to climate change, technological solutions for monitoring and mitigating pollution, engineering approaches to reduce emissions, artistic expressions of environmental advocacy, mathematical analysis of air quality data and climate trends, and social studies perspectives on the impact of air pollution and climate change on communities. Suitable for grades 7-12, this lesson plan aims to empower students to become advocates for clean air and climate action.

## Key Components

<b>Science (S): Understanding Air Pollution and Climate Change</b>	Topics: <ul style="list-style-type: none"><li>❖ Activity: Investigate the sources and effects of air pollution and greenhouse gasses on climate change, including emissions from transportation, industry, and natural sources.</li><li>❖ Project: Conduct experiments to measure air quality. Analyze data to identify trends and patterns in pollution levels and their impact on climate.</li></ul>
<b>Technology (T): Technological Solutions for Air Quality Monitoring and Climate Action</b>	Topics: <ul style="list-style-type: none"><li>❖ Activity: Research technologies used for monitoring air quality and greenhouse gas emissions.</li><li>❖ Project: Design and develop a prototype for an air quality monitoring system. Explore technological solutions for reducing emissions and promoting climate action.</li></ul>

<p><b>Engineering (E): Engineering Solutions for Air Pollution Reduction and Climate Mitigation</b></p>	<p>Topics:</p> <ul style="list-style-type: none"> <li>❖ Activity: Explore engineering solutions for reducing air pollution and addressing climate change, such as emissions control technologies, renewable energy systems, and sustainable transportation.</li> <li>❖ Project: Develop proposals for engineering projects that address the dual challenges of air pollution and climate change in the local community. Design and build prototypes of pollution control devices or renewable energy systems.</li> </ul>
<p><b>Arts (A): Artistic Expression of Environmental Advocacy and Climate Awareness</b></p>	<p>Topics:</p> <ul style="list-style-type: none"> <li>❖ Activity: Examine artistic expressions of environmental advocacy and climate awareness through visual arts, music, literature, and performance.</li> <li>❖ Project: Create artworks, songs, poems, or performances that raise awareness about air pollution, climate change, and the need for environmental action. Showcase student creations in a public exhibition or performance.</li> </ul>
<p><b>Math (M): Mathematical Analysis of Air Quality Data and Climate Trends</b></p>	<p>Topics:</p> <ul style="list-style-type: none"> <li>❖ Activity: Collect and analyze air quality data from monitoring stations or online databases, as well as climate data from weather stations and climate models.</li> <li>❖ Project: Use mathematical concepts such as statistics, modeling, and forecasting to analyze trends in air quality and climate change. Identify correlations and impacts on human health, ecosystems, and communities.</li> </ul>

**Social Studies (SS): Social and Economic Impacts of Air Pollution and Climate Change**

Topics:

- ❖ Activity: Investigate the social and economic consequences of air pollution and climate change on communities, including health disparities, environmental justice issues, and economic costs.
- ❖ Project: Research case studies of communities affected by air pollution and climate change. Analyze policies and initiatives aimed at addressing these challenges and promoting climate resilience and adaptation.

**Assessment Criteria**

By the end of this lesson plan, students will demonstrate a comprehensive understanding of air pollution, climate change, and their interconnectedness, as well as proficiency in interdisciplinary skills across STEAMS disciplines. Assessment will be based on project completion, research quality, critical analysis, creativity, and the effectiveness of proposed solutions. This STEAMS National Clean Air Month Project-Based Lesson Plan empowers students to take action for clean air, climate action, and environmental sustainability, fostering a sense of environmental responsibility and advocacy for a healthier, more resilient planet.