STEAMS Green Energy Project-Based Lesson Plan (6th-12th)

Objective: The objective of this project is to immerse middle and high school students in a STEAMS-based exploration of green energy technologies. Students will delve into the science behind renewable energy, use technology for data analysis, design and build simple engineering models, engage in artistic representations of sustainable practices, apply mathematical concepts to evaluate energy efficiency, and explore the social and economic implications of green energy solutions.

Purpose: This project provides students with a holistic learning experience, integrating various STEAMS components while addressing real-world issues and fostering community engagement.

Key Components

Science (S): Renewable Energy Sources	❖ Students study various renewable energy sources, such as solar, wind, hydro, and geothermal. ❖ Students explore the science behind how these sources generate energy and their impact on the environment.
Technology (T): Data Analysis for Energy Efficiency	❖ Students use technology tools to collect and analyze data related to energy consumption. ❖ Students investigate the efficiency of different energy sources and technologies in reducing environmental impact.
Engineering (E): Design and Build Renewable Energy Models	❖ Students engage in designing and building models that demonstrate the principles of renewable energy systems. This could include building a simple wind turbine, solar oven, or a model hydroelectric generator.
Arts (A): Sustainable Practices Art Project	❖ Integrate arts by having students create artistic projects that highlight sustainable practices. This could

	involve creating visual art, poetry, or multimedia presentations that promote awareness of green energy and environmental sustainability.
Math (M): Energy Calculations and Efficiency	❖ Students apply mathematical concepts to calculate energy output, efficiency, and cost-effectiveness of different renewable energy systems. ❖ Students analyze data to make informed decisions about the viability of these systems.
Social Studies (SS): Social and Economic Impact of Green Energy	❖ Explore the social and economic implications of adopting green energy solutions. ❖ Students investigate how communities and economies are affected by the shift towards sustainable practices.

Project Phases and Timeline

Week 1-2: Introduction to Green Energy	**Activities:** ❖ Overview of the project and its interdisciplinary nature. ❖ Introduction to different renewable energy sources and their benefits.
Week 3-4: Technology and Data Analysis	**Activities:** ❖ Introduction to technology tools for collecting and analyzing energy data. ❖ Students collect data on energy consumption and analyze the efficiency of different energy sources.
Week 5-6: Engineering Models of Renewable Energy	**Activities:** ❖ Engage in the engineering design process to build models that demonstrate renewable energy principles. ❖ Test and refine their models through experimentation.

Week 7-8: Arts Integration with Sustainable Practices Project	**Activities:** ❖ Create artistic projects that promote awareness of sustainable practices and green energy. ❖ Explain their projects, connecting them to scientific and social concepts.
Week 9-10: Math and Measurement	**Activities:** ❖ Apply math skills to calculate energy output, efficiency, and cost-effectiveness. ❖ Use mathematical models to compare and evaluate different renewable energy systems.
Week 11-12: Social Studies and Community Impact	**Activities:** ❖ Research and discuss the social and economic impact of green energy adoption. ❖ Develop presentations or reports on how communities can benefit from sustainable practices.

Assessment Criteria

Science	Understanding of renewable energy science principles.
Technology	Effective use of technology for data analysis.
Engineering	Creativity and functionality in engineering models.
Arts	Quality of artistic representations of sustainable practices.
Math	Accurate application of mathematical concepts to energy efficiency calculations.
Social Studies	Understanding of the social and economic impact of green energy.