STEAMS Alzheimer's Project-Based Lesson Plan (Grades 7-12)

Objective: The objective of this interdisciplinary lesson plan is to explore Alzheimer's disease from various academic perspectives, including its biological foundations, technological advancements in diagnosis and treatment, engineering innovations for care, artistic expressions of memory and identity, mathematical analysis of data trends, and the social implications of the disease. Through a STEAMS (Science, Technology, Engineering, Arts, Mathematics, and Social Studies) approach, students will engage in activities that increase awareness of Alzheimer's and the ongoing efforts to address the disease.

Key Components

Science (S): Understanding the Biology of Alzheimer's Disease	❖ Topic: Explore the biological mechanisms of Alzheimer's disease, focusing on the role of plaques, tangles, and the breakdown of brain cells. ❖ Project: **Neuroscience of Memory:** Investigate how different regions of the brain are involved in memory formation and deterioration. Create a diagram or 3D model of the brain to explain the changes that occur due to Alzheimer's disease.

Technology (T): Advances in Diagnostic and Assistive Technology	❖ Topic: Investigate how technology has advanced in the diagnosis, monitoring, and care for individuals with Alzheimer's disease. ❖ Projects: **Diagnostic Technology:** Research the current technologies used for diagnosing Alzheimer's, such as brain imaging techniques (MRI, PET scans) and genetic testing. Create infographic explaining these technologies. **Assistive Devices for Alzheimer's Patients:** Design a concept for an assistive device or app that could help individuals with Alzheimer's in their daily lives.
Engineering (E): Designing Spaces for Alzheimer's Care	❖ Topic: Explore how engineering and architecture can improve the quality of life for individuals with Alzheimer's by creating safe and supportive living environments. ❖ Projects: **Memory Care Facility Design:** Design a blueprint for a memory care facility that incorporates features to support individuals with Alzheimer's, such as wayfinding tools, safety features, and calming environments. **Smart Home Innovations:** Research how smart home technologies, such as voice-activated assistants and sensor systems, can be used to create safer living spaces for individuals with Alzheimer's. Develop a concept for a smart home designed for Alzheimer's patients.

Arts (A): Artistic Expressions of Memory and Identity	❖ Topic: Explore how art can be used to express and preserve memories, particularly in the context of Alzheimer's disease, where memory loss is a key symptom. ❖ Projects: **Memory Through Art**: Create a piece of visual art, such as a painting, collage, or sculpture, that expresses the concept of memory and identity in the face of Alzheimer's. **Storytelling Through Art**: Write a short story, poem, or song that explores themes of memory, loss, and identity, drawing inspiration from the experiences of individuals with Alzheimer's.
Math (M): Analyzing Data Trends in Alzheimer's Disease	❖ Topic: Use mathematical tools to analyze data on Alzheimer's disease, including prevalence, demographic trends, and healthcare costs. ❖ Project: **Prevalence and Demographic Analysis:** Analyze statistical data on the prevalence of Alzheimer's disease across different age groups, genders, and regions. Create graphs and charts to visualize the growth of the disease over time and compare trends globally.

Social Studies (SS): Social and Ethical Implications of Alzheimer's Disease	❖ Topic: Explore the social and ethical issues surrounding Alzheimer's, including caregiving, healthcare access, and the impact on families and communities. ❖ Project: **Ethical Issues in Alzheimer's Care:** Research the ethical challenges faced in the care of Alzheimer's patients, such as decisions about long-term care, autonomy, and end-of-life choices. Create a debate or panel discussion to explore these issues.

Assessment Criteria

Students should be assessed on their ability to integrate and apply knowledge from various disciplines, their creativity and critical thinking skills, and their engagement with the scientific, social, and ethical dimensions of Alzheimer's disease. The final assessment should include a comprehensive project that ties together the different STEAMS components, demonstrating a well-rounded understanding of Alzheimer's and the efforts to address it globally.