

STEAMS Kalpana Chawla Project-Based Lesson Plan (K-12)

Objective: The primary objective of this lesson plan is to immerse students in an interdisciplinary exploration of Kalpana Chawla's life and her contributions to space exploration, fostering scientific curiosity, critical thinking skills, and an appreciation for diversity in STEAMS fields. By integrating STEAMS components, students will delve into various aspects of Kalpana Chawla's story, including science, technology, engineering, arts, mathematics, and social studies.

Key Components

Science (S):	Topics: <ul style="list-style-type: none">❖ Investigate the scientific principles behind space exploration, including orbital mechanics, gravity, and the challenges of space travel.❖ Explore the role of astronauts like Kalpana Chawla in conducting scientific experiments and research in space.
Technology (T):	Topics: <ul style="list-style-type: none">❖ Utilize digital tools to research Kalpana Chawla's biography, her missions with NASA, and the technological advancements in space exploration.❖ Create digital presentations or multimedia projects to showcase key aspects of Kalpana Chawla's life and her contributions to space science.
Engineering (E):	Topics: <ul style="list-style-type: none">❖ Engage in an engineering design challenge inspired by the construction of spacecraft and space stations.

	<ul style="list-style-type: none"> ❖ Design and build models or prototypes of space vehicles, considering factors such as aerodynamics, propulsion, and life support systems.
Arts (A):	<p>Topics:</p> <ul style="list-style-type: none"> ❖ Explore the artistic representations of space exploration through literature, music, and visual arts. ❖ Create original artwork inspired by Kalpana Chawla's experiences in space, using various artistic mediums to capture the beauty and wonder of space travel.
Math (M):	<p>Topics:</p> <ul style="list-style-type: none"> ❖ Apply mathematical concepts to calculate orbital trajectories, velocities, and other parameters relevant to space missions. ❖ Explore mathematical puzzles or challenges inspired by the mathematics of space exploration, such as calculating fuel requirements or predicting spacecraft trajectories.
Social Studies (SS):	<p>Topics:</p> <ul style="list-style-type: none"> ❖ Delve into the social and historical context of Kalpana Chawla's life and her journey from India to becoming an astronaut with NASA. ❖ Discuss the impact of Kalpana Chawla's achievements on diversity in STEAMS fields and the importance of representation in space exploration.

Project Phases and Timeline:

Day 1: Science	<ul style="list-style-type: none"> ❖ Introduction to Kalpana Chawla and
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	the scientific principles of space exploration.
Day 2: Technology	❖ Research Kalpana Chawla's biography and the technological aspects of her space missions.
Day 3: Engineering	❖ Engage in an engineering design challenge related to spacecraft design.
Day 4: Arts	❖ Explore artistic representations of space exploration and create original artwork inspired by Kalpana Chawla.
Day 5: Math	❖ Apply mathematical concepts to solve problems related to space travel and orbital mechanics.
Day 6: Social Studies	❖ Discuss the social and historical context of Kalpana Chawla's life and her impact on diversity in STEAMS.

Assessment Criteria

Students will be assessed based on their participation in discussions, completion of assignments and projects, creativity in design challenges and artwork, and understanding of Kalpana Chawla's life and her contributions to space exploration.