

Space and aviation touches our lives every day and in so many ways.

Lots of subjects taught today can have educational discussions related to rocketry added to their academic curriculum.

The following items are various subjects with ideas on how to enrich them with space and aviation topics.

Physics

- Study Newton's three laws of motion and how they relate to rocketry.
- Study the principles of flight (lift, drag, thrust, controlling aircraft, etc.).
- Demonstrate Bernoulli's principle and how it relates to airplane airfoils.
- Study how lift and drag are produced on an airfoil.
- Study Rocket propulsion.
- Study the various types of forces (tension, bending, compression, shear, torsion) and how they relate to the structure of an airplane.
- Study Archimedes principle and how it relates to lighter than air craft.
- Use a wind tunnel to demonstrate forces of flight.
- Study how barometric pressure affects airplanes and rockets.

Chemistry

- Study the gases that make up the atmosphere.
- Discuss various fuels used in airplanes and rocket motors.
- Discuss the light spectrum and how it allows us to determine the chemical composition of stars and planets.
- Study closed ecological systems and air purification on spacecraft.
- Study Ozone depleting chemicals.

English/Communications

- Vocabulary building lessons which include aviation-oriented words.
- Study literature and poems that have an aviation theme.
- Write your own space related compositions.
- Study how to correctly write a research report utilizing a space topic as an example.
- Discuss the importance of communication skills in air traffic control; listening, speaking, viewing.
- Discuss record keeping techniques and how it might be important to someone interviewing a witness to an aviation disaster.
- Research ideas of flying as expressed by early man in mythology and legends.
- Discuss science fiction literature, and how it differs from fact.

Social Studies

- Study social, political and economic impacts of aviation and space.
- Study the laws and treaties that were enacted because of aviation and space progress.
- Discuss the many different types of jobs that are associated with aviation and space travel.
- Write a bibliographical sketch of a famous aviator or astronaut.

Geography

- Teach basic map reading skills using a real aeronautical chart (scale, symbols, direction, landmarks, etc.).
- Teach magnetism and compass reading skill (true north vs. magnetic north).
- Teach topography and why it is important to airline pilots.
- Teach weather and climates and how they are important to pilots.
- Teach other topics related to aviation:
 - Time zones
 - Great circle routes on the globe
 - Longitude and latitude
- Study how geography has been enhanced with remote sensing satellites.

History

- Why study the history of space and aviation?
 - Man's roots in the past.
 - Study of man's "total environment."
 - Study of man's capability or ability to use the aerospace environment.
 - Man's ambitions and initiative.
 - Man has always wanted to improve their environment; to do so he felt he must explore and use the resources of the aerospace environment.
- Study the folklore, legends and mythology about flight;
 - Greek, Roman, Chinese, Northern Europe, African, Middle Eastern.

History (Continued)

- Study how aviation and space has impacted world events (ie., wars, business, tourism, communications, navigation, etc.).
- Study the laws and treaties that were enacted because of aviation and space progress.
- Study the difference between space exploration and all other explorations (ie., financing, national goals, generation of new technologies, effect on education, etc.).
- Study awards (commemorative stamps and medals) given to aviation and space pioneers.

Mathematics

- Provide word problems that use a “space” theme for any topic being taught.
- Discuss the importance of a subject being taught on safe and successful space travel.
- Teach how to track a rocket using trigonometry.
- Teach statistics using safety and success rates of rocket launchers

Biology

- Study the physiological effects of space and aviation on the human body.
- Study the influence of plants and animals in aviation:
 - Flying tree seeds
 - Flying dinosaurs (pterosaurs)
 - Flying mammals (bats, squirrels)
 - Reptiles (flying frogs)
 - Insects
 - Fish
- Using a high altitude photo, map the vegetation and try to determine its type.
- Study how space and aviation affects agriculture:
 - Crop dusting
 - Cloud seeding
 - Remote sensing satellites

Biology (Continued)

- Study the use of animals in space research.
- Study the effects of space launches on circadian rhythm.
- Study how Hypoxia related to space travel.
- Study the requirements of environmental control systems for spacecraft.
- Hypothesize about extraterrestrial life.

Foreign Languages

- Study the influence of a particular language on aeronautical terms.
- Have the students find out what is the official language of all international airline pilots and why.
- Take a field trip to an “international” airport to listen to the different languages being spoken.
- <https://www.liveatc.net/>

Music

- Study the national anthems of various countries a person might visit on a round-the-world-trip.
- Study classical music which was inspired by airplanes (Up, Up and Away; Lucky Lindy, etc.).
- Study music inspired by the space age (Fly Me to the Moon, 2001 Space Odyssey, Star Wars, etc.).

Art

- Use airport building and runways to teach perspective.
- Design your own “Space Port.”
- Study the way space art has changed over the last 30 years.
- Create your own space art.
- Paint your model rocket with unique patterns or decorations.
- Study Commemorative stamps.
- Study the aviation drawings of Leonardo Da Vinci.
- Design your own launch insignia patch.
- Design the interior of a space station.
- Design your own kite.

Health & Fitness Education

- Discuss the importance of drug and alcohol abstinence from a 'pilots' point of view.
- Study the importance of physical fitness to an airline pilot or astronaut.
- Recreate the physical training program of the early astronauts.
- Study vision problems and how they might impact a pilots ability to fly an airplane (night flying too).
- Study the effects of noise pollution on people who live near airports.
- Study how jet lag effects the human body.
- Study the effect of sensory deprivation might have on an astronaut.
- Study temperature control on a spacecraft.
- Define the requirements of a life support system on a interplanetary spacecraft.

Environmental Sciences

- Study the atmosphere (composition, pressure, density, temperature, humidity, wind currents).
- Study the effects of high speed aircraft on the ozone layer.
- Study the effects of different types of rocket propellants on the upper atmosphere.
- Study the effects of greenhouse gases.
- Study environmental research satellites (remote sensing) and how they've impacted environmental sciences.
- Study how the geology of earth differs from other planets.
- Study how to obtain information about the geology of other planets.
- Study earth's magnetism and how it effects airline travel.
- Study how radiation caused by the Van Allen Belt affects manned spacecraft orbiting earth

Technology Education

- Study the principles of flight.
- Study the different types of aerospace vehicles:
 - Lighter-than-air vehicles (balloons, blimps, dirigibles)
 - Gliders
 - Propeller driven aircraft
 - Jet-powered aircraft
 - Helicopters
 - Manned rocket ships
- Use a kite to demonstrate aviation principles
- Study the control system of an airplane

Technology Education (Continued)

- Build your own model rocket or airplane to demonstrate design principles.
- Study the different types of rocket propulsion systems:
 - Solid propellant
 - Liquid propellant
 - Nuclear powered rockets
 - Ion propulsion rocket motors
 - Solar Sails
- Study the various methods of creating energy on a spacecraft.
 - Batteries
 - Fuel Cells
 - Solar panels
 - Nuclear reactors
 - Brayton & Stirling cycle motors

Industrial Arts

- Study metal alloys and how they are used in spacecraft.
- Study how advanced composites have improved the efficiency of airline travel.
- Study the various manufacturing processes in the creation of rockets.
- Build a launch system to ignite your own rockets.
- Design a spacecraft

Home Economics

- Study the materials and fabrics used to create a spacesuit.
- Study the requirements of food and nutrition on long range space travel.
- Design the interiors of airplanes and spacecraft.

Business Economics

- Study how insurance regulations affect airline and spacecraft.
- Study how patent laws promote aviation business.
- Study how the lack of “profits” have inhibited space exploration.
- Study the current state of general aviation aircraft manufacturing in the United States.
- Research the causes and effect of airline ticket pricing policy.

Computer Sciences

- Use your computer to access various networks to retrieve information on any space or aviation subject being studied.
- Write a simple program to calculate the altitude of a rocket from the angles measured during a launch.

Astronomy

- Study the Hubble Space Telescope and how it has changed astronomy.
- Study the sun, and how its effects space travel.
- Discuss how man's knowledge of the moon changed after Apollo flights.
- Design a space ship to reach another star system.
- Discuss a light spectrum and how it allows us to determine the chemical composition of stars.
- Study Interplanetary travel.
- Other Astronomy topics:
 - Asteroids
 - Comets
 - Constellations
 - Cosmic Rays
 - Meteors
 - Solar System
 - Telescopes