

With the creation of the sixth military branch - Space Force - and more than 100 rockets being launched into space each year, growth in the aerospace industry is robust. If you watched any lift-offs on TV and thought you would like to be on a future flight, collaborate with NASA on designing engines or developing flight plans, then aerospace engineering is for you!

Throughout this Expedition, you will LEAD YOUR LEARNING by fully engaging with the resources and activities. You will be asked to -



- **REFLECT** about your skills, learning goals, and purpose
- **STRETCH** your knowledge and skills through active learning
- **INNOVATE** and iterate solutions for real-world challenges
- **SHOWCASE** your innovations and learning in a dynamic way

We encourage you to utilize our [Expeditions Idea Book](#) as you navigate this Expedition as a resource and space to get your creativity flowing, organize your ideas and research, and share your innovations and reflections.



Every so often you may see this briefcase icon. That indicates an opportune time to have a conversation with a mentor or local business leader to discuss industry trends, ideate solutions, solicit feedback, and/or present your project. (Speak to your educator if you need support making contact.)

REFLECT

As you watch [the video](#), think deeply about these questions:



- What excites you about space engineering?
- What skills or traits would help you succeed in a career in space engineering?
- What parts of Raytheon’s work can you see yourself doing?

Take a peek at what your future workplace in space engineering could look like in this video from Raytheon Technologies, a NAF Industry Partner.

WHY A CAREER IN AEROSPACE ENGINEERING?



Want a career that entails cutting-edge technology, international travel, designing and developing civil and military aircraft, missiles, satellites, space vehicles, and more? Then, aerospace engineering is for you!

According to the U.S. Bureau of Labor Statistics, the potential for earning and growth in this career is higher than many other industries. Check out these statistics:

\$122K+

median annual wage

3,700

projected yearly job openings through 2031

6%

projected job growth through 2031

Whose expertise can you tap into to learn more about this career? Could they participate in an informational interview with you and your peers or serve as a mentor?



AEROSPACE ENGINEERING PROVIDES VAST OPPORTUNITIES!

There are many specializations in the field of aerospace engineering. Take a look at some of these!



..... ► **ASTRONAUTICS** - deals with spacecraft and spaceflight for exploration beyond Earth



..... ► **AVIONICS** - creates advanced communication, navigation, and control systems for pilots and astronauts



..... ► **PROPULSION** - focuses on designing engines for aircrafts and spacecrafts, like jets and rockets



..... ► **FLIGHT DYNAMICS** - considers factors like lift, drag, thrust, and weight to ensure that air/spacecrafts can fly safely and efficiently



..... ► **SPACE SYSTEMS** - involves working on advanced technologies for space exploration and travel like satellites and space stations



..... ► **AIRCRAFT DESIGN** - combines aerodynamics and computer programs to design aircraft that can soar higher and faster

STRETCH

Expand your knowledge and skills by trying some of these activities:

- Take a 3D look [inside a modern jet passenger aircraft](#): electronics, hydraulics, flight control surfaces, fuel system, water and waste, lighting, and more!
- Try [coding a landing on Mars](#). You can model the process of entry, decent, and landing using coding language such as Python, and land a spacecraft on Mars.
- Try one of [these activities](#) from NASA's Jet Propulsion Lab.
- Check out [how UNICEF uses drones to address transport, connectivity, and emergency preparedness](#)
- Learn what it's to work at [NASA's Jet Propulsion Lab](#).
- Meet these [amazing female aerospace engineers](#).

What are some other resources you can find that relate to your interests in Space Engineering?



Mentors could speak to how space engineering has changed their job/company/industry, where they see this going in the future, or the overall impacts.



OPPORTUNITY ALERT!



Become a member of American Institute of Aeronautics and Astronautics (AIAA)! It's free for K-12 students and will be your lifelong link to reliable resources and growth opportunities.

[JOIN TODAY](#), and learn about scholarships, their mentor matching, and more!



STRETCH

Expand your knowledge and skills by exploring some of these resources:

THE ENGINEERING DESIGN PROCESS

As you think about problems to solve and what to innovate, be sure to implement the engineering design process. Even if you are not planning to be an engineer, this process and its different phases help with problem-solving, generating creative ideas, and communicating your project.

Check out the graphic below or watch [this video from Discover Engineering](#).

THE ENGINEERING DESIGN PROCESS





INNOVATE

Identify a problem in your community (school, local, state, or global) or this industry, then innovate ways solve it.

<p>DEVELOP A PRODUCT</p>	<p>Create a new product (digital or non-digital) that would solve the problem you have identified. (Consider designing, wireframing, or prototyping using platforms like Lucid, ProtoPie, or Figma, or code an app in MIT App Inventor.)</p>
<p>FIX A FLAW</p>	<p>Perform some user testing on an existing product and think of ways to remix and improve it for diverse users. Is there a practice or product that has a flaw you'd like to fix? Consider diverse users, then use that feedback to improve and recreate a product.</p>
<p>BE A CHANGE-MAKER</p>	<p>Create a movement at your school or community to amplify this industry or the skills sets needed to succeed in this field. You can start a chapter for a Career & Technical Student Organization (CTSO) or professional organization related to this field, host a college/career fair or local competition to highlight this industry. How about developing a civilian or humanitarian project, which uses to UAVs to provide resources to remote locations or underserved communities? The possibilities are endless!</p>



PRO TIPS:

- If the choices above don't appeal to you, you can create-your-own or generate ideas by exploring hackathon sites like [hackclub](#) or [devpost](#).
- As you ideate, consider using [customer journey mapping](#).



Is there a mentor or industry partner who can discuss the Engineering Design Process or UX Design Process to support your innovation? How can you gather mentor feedback as you iterate and innovate?



SHOWCASE

Once you complete your innovation, share your learning with the with an audience in one or more of these ways:

Why not plan a showcase where you and your peers can share presentations with the whole school, at a parent night, or for a panel of industry professionals?



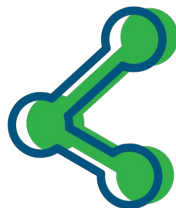
DIGITAL PORTFOLIO OR SITE	Create, code, or build a simple webpage to highlight your innovation, project, and learning journey. Consider bulb digital portfolios, Replit, GitHub, Google Sites, or Wix. Once it's developed, present it to an audience, and solicit feedback.
ONLINE MEDIA	Create a blog, vlog, or social media campaign (LinkedIn, YouTube, etc.) to highlight your innovation, project, and learning journey. Feel free to tag @nafcareeracads.
PITCH IT!	Pretend your audience is a group of investors. Pitch your innovation to them, sharing what you learned in the process. Allow for a Q&A, then solicit feedback on the quality of your project and/or pitch.

PRO TIPS:



- Level up your project by entering a school or district competition or challenge. (Think the science fair, CTSOs, hackathons, etc.)
- Not interested in options from our Showcase menu? You can present your creations in a format of your choosing.

STUDENTS, SHARE YOUR INNOVATION!



NAF would love to see your creation! After you get your educator's permission, submit yours [HERE](#). We may highlight you on social media!

(We WILL NOT share your work without your educator's and your approval.)