

TALENT FOR TOMORROW

ELA Lessons and Activities About Aerospace Careers

DEAR TEACHER,

Welcome to the Talent for Tomorrow educational program!

America's aerospace industry is on the forefront of scientific and technological innovation, advanced manufacturing, and exploration. Get your students thinking about an exciting and fulfilling career in the field with these research-based lessons and activities.

In this packet you'll find:

- ✓ One lesson on aerospace careers
- ✓ Two activity sheets about work in the aerospace field
- ✓ A classroom poster featuring exciting jobs in the industry



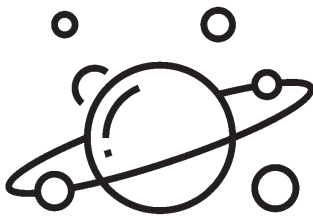
Visit [scholastic.com/talentfortomorrow](https://www.scholastic.com/talentfortomorrow) for more classroom resources.

GOAL Students will learn about exciting careers in the aerospace industry and the skills needed to be an aerospace professional.

TIME REQUIRED Two to three class periods

MATERIALS

- ☆ Classroom poster
- ☆ Research Project activity sheet
- ☆ Career Connector activity sheet



1 Inform students that jobs within the aerospace industry (and in any industry) require a specific set of skills. Explain that this includes a combination of technical and nontechnical skills. Using the definitions below, explain the two types of skills and give an example of each. Then ask students to review the information on the poster and brainstorm different skills required for each job and categorize them as technical or nontechnical.

- **Technical skills** are the knowledge and capabilities to perform specialized tasks.
Examples: coding, programming, data modeling, system design, computer-aided design and manufacturing, engineering analysis
- **Nontechnical skills** include social, cognitive, and communication skills that can enhance technical skills and boost overall job performance.
Examples: written and verbal communication, planning, critical thinking

2 Ask students to discuss which of the jobs on the poster front interest them most and why. In small groups or as a class, explore ways to develop the skills they'd need for that job (using the skills lists they made in step 1). Encourage students to think of opportunities both inside and outside of school that would help them reach their goal. Support student discussion with an overview of the following personal development opportunities: school clubs; summer camps; volunteering; STEM programs or contests at school or in the community, such as the Team America Rocketry Challenge (rocketcontest.org); programs at STEM museums; online courses or research.

3 Distribute copies of the Aerospace Careers Research Project activity sheet. Split the class into groups and assign each group a sector of the industry to research (see activity sheet for sectors). Explain that students will be identifying job qualifications for one or two jobs that exist in their assigned sector. Direct students to use reference books or kid-friendly search engines to find information on the kind of work that is done in each sector and the jobs that are involved.

4 When the groups have finished their job research, **hold a mock career fair** in the classroom where each group presents what they've learned about their interest area to the rest of the class. Encourage students to take notes and remember the types of jobs that they learned about and the skills required.

5 Divide the class into groups and **distribute copies of the Aerospace Career Connector activity sheet.** Explain to students that they will read about real work that is currently being done in the aerospace field. They will then read scenarios in which they imagine being an aerospace professional and use their knowledge of math and science, as well as their creativity and collaboration skills, to answer critical-thinking questions.

YOU ARE THE TALENT OF TOMORROW

Students your age are the engineers, scientists, and coders of the future—and someone like you will grow up to build innovative systems for aviation, defense, and space exploration.



International Space Station orbiting Earth

Launch | AEROSPACE ENGINEER

Do you think that rockets naturally know where to go when they lift off? Aerospace engineers plan how rockets launch and how spacecraft operate in orbit and beyond Earth's gravitational pull. They are working on the science, technology, and math that will get astronauts to Mars!

- ★ What can we learn from exploring space?
- ★ What factors do engineers need to consider when they build rockets that carry astronauts?



NASA autonomous Global Hawk drone helping monitor forest fires and atmospheric phenomena

Navigation | ELECTRICAL ENGINEER

Ever wonder who develops the state-of-the-art navigation systems that support safe air travel? Electrical engineers do! They design, troubleshoot, and test innovative electrical equipment for spacecraft or aircraft. Today's electrical engineers are developing unmanned aircraft systems, which fly by remote control—even from miles away.

- ★ What steps need to be taken before we have unmanned passenger airplanes?
- ★ What beneficial uses can you imagine unmanned aircraft systems providing?



Global cybersecurity center

Protection | SOFTWARE DEVELOPER

Do you know who protects your information and identity on the Internet, social media, and more? Software developers are programming specialists who use math and computer science expertise to keep information systems safe and protected against increasing cyber (online) threats. Aerospace companies need cyber professionals to develop the security software of the future to maintain the safety of air transportation and of space and defense operations.

- ★ Why is cybersecurity necessary for our safety?
- ★ What kinds of information do these systems protect?

Speed | MECHANICAL ENGINEER

Planes, ships, and rockets move pretty fast—but how? Future mechanical engineers will invent safer, more efficient, and higher performance propulsion (the force that makes things move) systems to power vehicles from the depths of the ocean to the far reaches of space. A student like you who enjoys building things and completing hands-on projects will find better ways to propel these machines forward.

- ★ How will the world benefit from faster and more powerful ships, planes, and spaceships?
- ★ What will more efficient engines help us do?



Jet engine

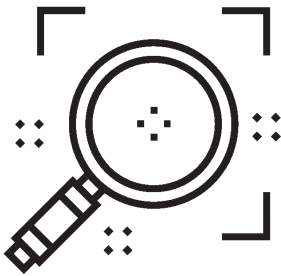
THINK LIKE AN AEROSPACE PROFESSIONAL.
WHERE COULD THE AEROSPACE FIELD TAKE **YOU?**

Brought to you by



AEROSPACE CAREERS Research Project

Directions: Using the classroom poster as a reference, work in teams to research your assigned aerospace job category and use the information you've gathered to answer the prompts below. You will then present this information to your classmates in a mock **career fair** (an event in which companies visit a high school or college to talk to people about jobs) and learn about one another's fields.



AEROSPACE JOB CATEGORIES

- | | |
|--|-----------------------------|
| 1. Engineering Design | 4. Technical Management |
| 2. Modeling, Simulation, and Product Testing | 5. Manufacturing |
| 3. Scientific Research | 6. Informational Technology |

Job category: _____

1 In the space below, write a **short overview** of your assigned category. Use these questions to help: What kind of work is done in this part of the aerospace industry? What are they responsible for doing or creating? What impact does this part of the industry have on the country or the world?

2 Next write down some **job titles** that exist in this category:

3 Choose one job: _____

On a separate sheet of paper, write a job description of this job.
Be sure to include the following information:

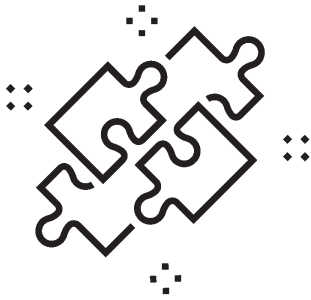
SKILLS including technical and nontechnical

TASKS that someone with this job would complete

TECHNOLOGY that is used, worked on, or created in this sector



AEROSPACE CAREER CONNECTOR



Knowing a lot about math and science isn't all that will make you successful at an aerospace job. You'll also need creativity, critical thinking, communication, collaboration, and problem-solving skills.

Directions: Imagine that you are an aerospace professional working on new, cutting-edge technology. Discuss the mission questions with your group to come up with the best answers, and don't be afraid to think outside the box!

MISSION BACKGROUND

Right now, a round-trip for astronauts to Mars could take as long as three years. The low gravity and the radiation may cause weakened muscles and reduced bone mass. To enable the trip, aerospace engineers could develop new rocket technologies to make the trip faster or produce better life support systems to make the journey safer and more comfortable.

YOUR MISSION

How should your team of engineers decide what to research and build? What factors do you need to consider for each possibility?

MISSION BACKGROUND

Aircraft designers must make decisions about when to use traditional manufacturing versus newer methods such as **3D printing**. With 3D printing, engineers can create lighter aircraft parts and produce pieces that cannot be made through traditional methods.

YOUR MISSION

Your team is tasked with designing new parts for an aircraft that is scheduled to fly in two months. Come up with a plan for how you will design and create the parts. What designs could you create through 3D printing that could not be made through traditional manufacturing? How would you take an existing part and make it lighter through 3D printing?

MISSION BACKGROUND

NASA is preparing the launch of the James Webb Space Telescope into orbit a million miles from Earth. This infrared telescope has observational instruments that need to be about 400 degrees below zero Fahrenheit. The telescope needs to be this cold in order to see the invisible infrared light from the beginning of the universe—nearly 14 billion years ago!

YOUR MISSION

Imagine you are on a team of astrophysicists and engineers building a new telescope to send into orbit. What factors should you take into consideration when building the telescope? If the prototype (an early test version) doesn't function properly, what are the next steps?

