

Airport Design Challenge

Educator Toolkit

Welcome to the STEM AVSED Airport Design Challenge Toolkit, a collection of helpful materials and resources you may use during your journey. Have questions or comments? Please contact the Airport Design Challenge team at avsed.challenge@faa.gov.

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Federal Aviation Administration

ABOUT AIRPORT DESIGN CHALLENGE

The Airport Design Challenge (ADC) is a dynamic educational initiative and collaborative opportunity designed for students in grades K-12. Organized and sponsored by the FAA Science, Technology, Engineering, and Math Aviation and Space Education (STEM AVSED) Program, this challenge aligns with the program's mission to inspire a students to pursue careers in aerospace, fostering a continuous pipeline of professionals for a thriving workforce in the future. The overarching vision of the STEM AVSED Program is to empower today's youth to explore and connect with the aerospace careers of tomorrow.



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The challenge utilizes the learning management platform Blackboard and is structured as an interactive learning and collaboration opportunity for students in grades K-12. Throughout the Airport Design Challenge, students gain the unique opportunity to design virtual airports within the Minecraft platform, guided by insights from FAA aerospace and engineering experts. Engaging in this challenge allows students to interact with aviation professionals, collaborate with fellow designers, and acquire valuable knowledge about the aerospace industry. This hands-on experience offers a practical application of STEM concepts in an aviation context, enabling students to apply their academic knowledge and skills to professional simulations. . The Airport Design Challenge can be done as a whole class assignment; however, each student must sign up and participate individually.

While participants are encouraged to form teams of up to five members, individual participation is also welcome. The instructional modules cover a wide range of topics, including airport layout, pavement and lighting, structures, and innovative growth. Progress assessments and

feedback are provided through module knowledge checks and the submission of screenshots showcasing students' designs.

The Airport Design Challenge is flexible and can be integrated into various educational settings, such as individual passion projects, homeschool curricula, school-based STEM programs, community organizations, and aviation-focused groups. Students are able to work on the challenge up until the submission deadline, including over the summer. The program is designed to be accessible to students worldwide, regardless of geographic location or educational background.

QUICK START GUIDE

HOW TO GET MINECRAFT

Minecraft is available in two versions: the regular edition and the educational edition. The educational edition comes equipped with tools and features designed to facilitate a classroom environment within Minecraft for educators. If you do not already possess a copy of Minecraft, inquire with your school or school district about the availability of a license or whether one can be provided to you.

If you do not have a copy of Minecraft, it can be obtained on various platforms, including Windows, Mac, gaming consoles, or mobile devices. However, note that the educational edition is exclusively accessible on Windows, Mac, Chromebooks, and iPad.

How to Install:

The installation process for Minecraft varies depending on your platform. For mobile phones and gaming consoles:

1. Visit the app store or game store and download the game. Once the download is complete, the game will be ready to play.

To install Minecraft on your computer, follow these steps:

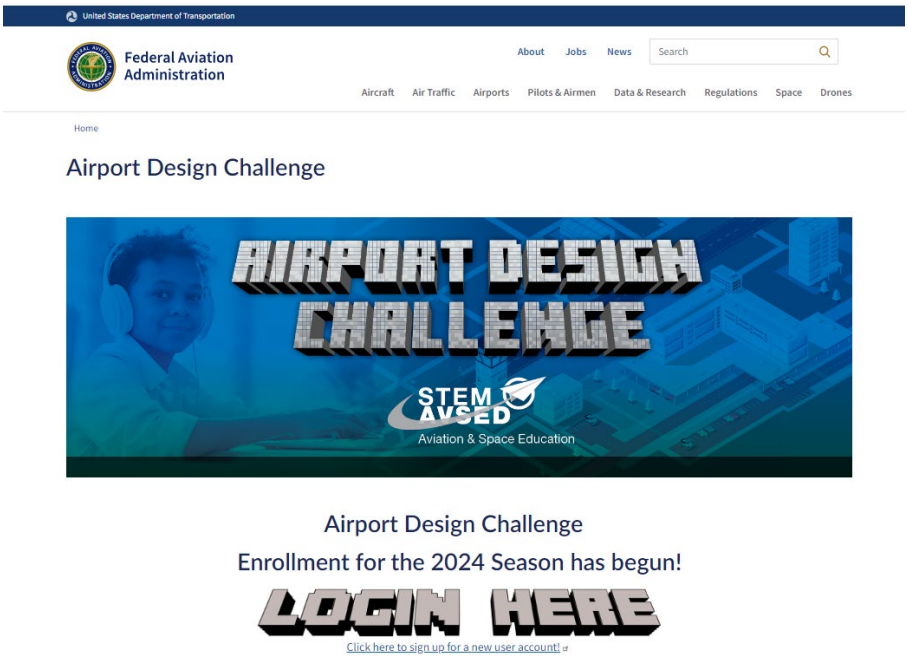
1. Go to Minecraft.net to download the installer package.
2. After downloading the package, open the file to install the game onto your computer.
3. Upon installation, log in to your account.
4. Congratulations! You are now prepared to embark on the Airport Design Challenge.

For additional guidance, please check-out our Minecraft ADC Tutorials, available here.



CREATE AN ACCOUNT

Go to the [ADC website home page] and click on "Login Here" to register for the game. Students will need their parent and/or teacher to complete the form and provide parental permission to play. The good news is the updated enrollment process, including the automated parental verification, should only take a few minutes to complete.



PROGRAM SCHEDULE

The Airport Design Challenge can be started at any point throughout the year; however, most students typically start in the Fall once the new academic year has begun. The program

includes six modules for students to work through prior to submitting their design. Although the challenge is year-round, in order to be eligible to win the challenge all final submissions are due on or before August 31 of the current calendar year.

Here is the recommended Program Schedule:

ORIENTATION

Alexander Graham Bell taught that, “before anything else, preparation is the key to success.” During orientation, there are a lot of tasks that you have to complete in order to be ready for the challenge to start.

1. Prior to beginning the challenge, you should complete:
    a. Student Entry Survey
    b. Tips Toward Success
    c. Build Your Team
    d. Choose Your Airport

MODULE 1: PAVED SURFACES

To get started, make sure students understand how runways and other paved surfaces are laid out, then begin building them in Minecraft. This is usually the hardest part of the entire project so encourage students to take their time and make sure it is done just right.

1. By the end of this module, students should complete:
    a. Airport Knowledge Pre-Test
    b. Individual Assignment – SMART Goals
    c. Group Assignment – Airport Layout Plan Part 1
    d. Module 1 Knowledge Check Quiz

MODULE 2: SAFETY AREAS & SECURITY

This module will give students a bit of a break after all the long, hard work they did on paved surfaces. In this module students will build a perimeter fence around your airport, including the gates to allow vehicles and people through. In addition to fences, students will want to make sure there are no obstructions at the end of your runways.

1. By the end of this module, students should complete:
    a. Individual Assignment – Airport Security
    b. Group Assignment – Airport Layout Design
    c. Module 2 Knowledge Check Quiz

MODULE 3: LIGHTING, MARKINGS, AND SIGNS

Adding airport lighting, markings, and signs requires some real attention to detail, but it is that detail that really makes your airport start to look like the real thing. Take your time this week and make sure you add as much detail as possible!

1. By the end of this module, students should complete:

a. Know Your Airport Lighting, Markings, and Signs Quiz
b. Individual Assignment – Airport Operations Staff
c. Group Assignment – Airport Layout Plan
d. Module 3 Knowledge Check Quiz

MODULE 4: AIRPORT BUILDINGS

In Module 4, you should begin putting in all of the buildings on your airport. Some airports have a lot of buildings, and some have much less, but each building is unique so consider how you can make each one look as close to the real thing as possible. Hint: Consider asking for an airport tour!

1. By the end of this module, students should complete:
    a. Individual Assignment – Airport Buildings
    b. Group Assignment – Airport Layout Plan
    c. Module 4 Knowledge Check Quiz

MODULE 5: INNOVATION & GROWTH

Like most things, airports have grown through new technology, ideas, and needs. In Module 5, you get to stretch your creativity and determine what your airport could look like in the future. Perhaps it will have a new tower, a bigger terminal, or longer runways. Enjoy your own innovation!

1. By the end of this module, students should complete:
    a. Individual Assignment – Innovation
    b. Group Assignment – Airport Layout Plan
    c. Module 5 Knowledge Check Quiz

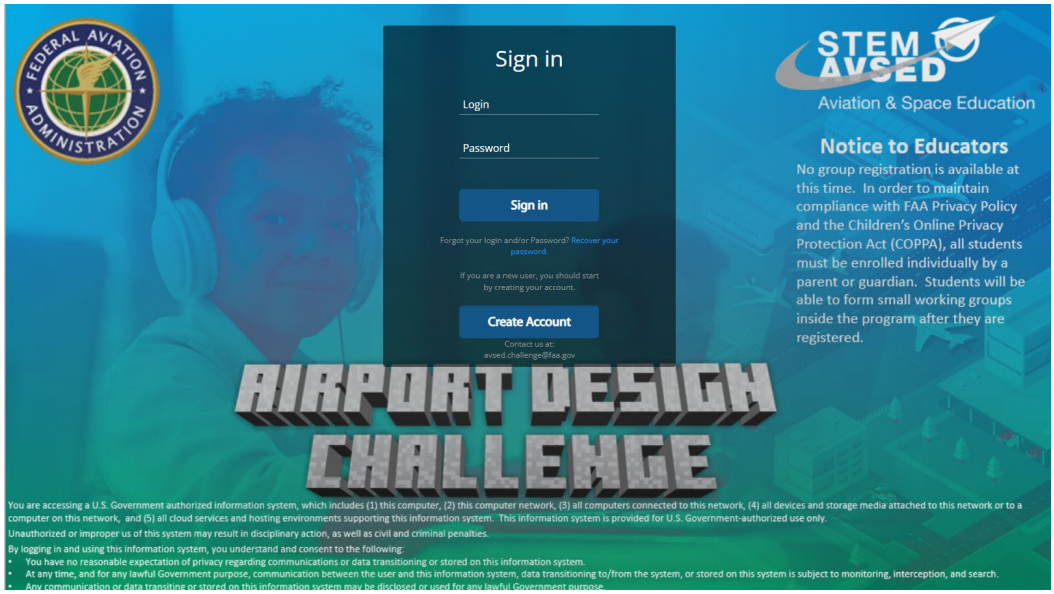
MODULE 6: FINAL AIRPORT TOUR

This is it, your chance to show off all your work since Day 1! You will take our judges on a brief, virtual tour of your Minecraft airport. Remember, you can only turn in your final video once all the Module Quizzes have been completed.

1. By the end of this module, students should complete:
    a. Airport Knowledge Post-Test
    b. Final Project – Airport Video Tour

BLACKBOARD OVERVIEW

To participate in the Airport Design Challenge, students need to individually register and obtain parental or guardian consent. The registration process is entirely electronic and can be initiated by visiting the ADC website at faa.gov/adc and clicking on the “Click here to sign up for a new user account!” link.



Once registered, students will independently complete the online Blackboard modules. While coursework and activities can be done outside of Blackboard, it is crucial for each participant to successfully complete all knowledge checks before submitting their final project.

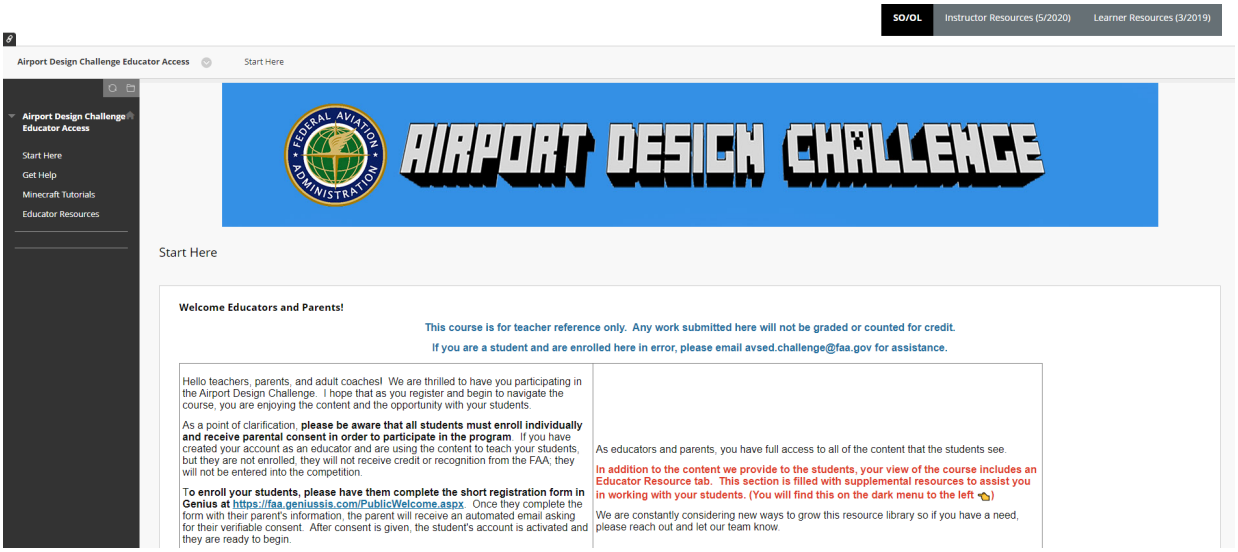
Upon logging into the Blackboard system, students will encounter a visible timer indicating the time left to complete ADC for the current cycle, fostering awareness among participants. As they navigate the system, students will find learning modules aligned with the earlier-discussed schedule, each including lessons, activities, and concluding with a knowledge check. We strongly recommend adhering to the suggested schedule, completing tasks in the specified order to ensure success, avoid mistakes, minimize rework, and prevent long-term fatigue throughout the project. Starting with the orientation is crucial.

In addition to core content, students can access Minecraft tutorial videos and message boards within Blackboard, providing a platform to pose questions and connect with fellow participants. We encourage active engagement with the community and FAA employees who moderate the message boards.

Our objective is to equip students with all the necessary resources for success, achieved through the thoughtful design and implementation of the Blackboard system. If students encounter challenges, we welcome feedback at avsed.challenge@faa.gov. While we continually work to review, audit, and enhance the experience, your input, and that of your students, is invaluable.

Educator Access:

In the latest updates, educators, parents, and mentors now have exclusive access to their own Blackboard hub within the Airport Design Challenge (ADC). Upon registering for a parent account on the ADC webpage, you gain entry to the dedicated educator section of Blackboard.



It's important to note that this hub is distinct from the students' Blackboard interface but precisely mirrors their course content. In addition to providing access to course content, the parent hub offers supplementary resources, message boards, and valuable tips for success, acknowledging the unique needs of educators, parents, and mentors participating in the ADC.

We understand that this setup may differ from your typical coursework experience, as direct monitoring of students' progress within the system is not possible. This intentional separation safeguards sensitive information and data of all participants while streamlining the grading and review processes for final submissions.

If you would like to receive regular progress reports solely on your student' completion and scores for assignments throughout the challenge, the ADC team is available to assist. Simply reach out to avsed.challenge@faa.gov, and we will be happy to accommodate your needs.

RESOURCES AVAILABLE

EDUCATOR FAQS

We have organized our most frequently asked questions into an Educator FAQ webpage. This webpage is regularly updated to serve as a resource for information related to the Airport Design Challenge.

SUBSCRIBE TO THE MAILING LIST

To learn more about future design challenges and STEM-AVSED events and opportunities, considering joining our mailing list.

OFFICE HOURS & TOWN HALLS

We offer monthly live office hours, which are led by FAA educator mentors for the ADC program. These are available to all educators, and we invite participants to come with questions or hear questions and ideas from other educators.

The ADC 2024 Office Hours are scheduled monthly from 10:30 – 11:30 AM Eastern Time (USA). Exact dates are listed on the resources page of Blackboard.

Email your STEM AVSED Point of Contact or avsed.challenge@faa.gov for the direct link.

GET THE WORD OUT: DIGITAL TOOLKIT

Take a look at the Airport Design Challenge Digital Toolkit. In the toolkit, you can find a variety of resources for you to share with your networks, including videos, sample social media posts, email templates, ADC graphics, and official FAA channels to stay up to date with the agency.

The Airport Design Challenge Digital Toolkit is available at www.faa.gov/adc/toolkit

CONNECT WITH US

Don't forget to tag the FAA's social media accounts so we can amplify your posts!

- Twitter: @FAANews
- Facebook: @FAA
- LinkedIn: @FAA
- Instagram: @faa

Feel free to connect with use via email for any Airport Design Challenge questions at avsed.challenge@faa.gov.

To stay connected with FAA STEM AVSED check out www.faa.gov/education/contact-us