STEM AVSED
Aviation & Space Education

STEM ACTIVITY:
"Create an Airport Layout Plan"
Classroom Activity Educator Guide

OVERVIEW

In this lesson, students learn about the different structures on an airport and how they interact with each other. Utilizing provided resources, students research an airport local to their home and then generate a complete Airport Layout Plan with all major components.

Objectives

Students will be able to:

- Identify each major structure on the airport
- Understand the complexity of both large and small airports
- Work together in small groups to develop a complete Airport Layout Plan

Materials Required

- Identify Components of the Airport PowerPoint Presentation
- Worksheet – one per student
- Large paper or poster- one per group
- Meter stick or similar straight edge
- Pencils, markers, etc.
- Computer with internet access or aerial photos of airports

Preparation

- Pre-identify a variety of NPIAS airports in your local area that you can assign to your students.
- Gather all necessary materials listed above. Each student should be given their own printed worksheet.
- Provide computer/internet access for students to research their respective airports
- OPTIONAL FIELD TRIP – Coordinate tour of airport with airport manager (see page 7)

Standards

- Certification of Airports (14 CFR Part 139)

Other Resources

- Access our AVSED Educator Resources page at www.faa.gov/education/educators/southwest-region-avsed-educator-resources
- The FAA has hundreds of outreach representatives who are interested in assisting you with your programs. Visit www.faa.gov/education to find a representative near you!
- To contact the Airport Design Challenge team directly, send an email to avsed.challenge@faa.gov

LESSON PLAN

Instruction & Discussion

1. OPTIONAL – Airport Tour Field Trip (see page 7)

2. Present "Identify Components of the Airport" PowerPoint presentation.
   - Note – this presentation is intended to be adaptable based on the time you have allotted for the discussion. Each slide is equipped with a video and talking points to assist you. Feel free to adapt the length and depth of your presentation to fit your needs.

3. Using a variety of resources, show students images of airports from the ground and from the air. Topics of discussion could include:
   - Varying complexities of airports – Primary vs. Non-Primary airports
   - Finding airports in your local area - https://www.airportiq5010.com/5010Web/
   - Reading and understanding the 5010 reports
   - Major components of the airport including paved surfaces, obstructions, perimeters, lighting, markings, signs, buildings & other facilities, etc.

   NOTE - In addition to the 5010 Report, the following sites may be useful in finding satellite views, airport diagrams, and more:
   - **www.airnav.com**
   - **earth.google.com**

Activity

1. Divide the students into groups of 2-3 members.

2. Instruct students to choose an airport near their home that they would like to research

3. Using the provided worksheet, instruct students to identify all major components of their chosen airport

4. Using a variety of supplies, challenge the students to draw a complete airport layout plan with all major components of their airport.

5. Consider having each group present their ALP and discuss the major components (If the actual ALP is available from the airport, students enjoy comparing their own drawing to the real thing)

6. Introduce students the FAA's Airport Design Challenge to provide further learning and participation on their own.

WORKSHEET

"Airport Layout Plan" Student Worksheet

Name(s)_____ Date_____

Worksheet: Identifying Airport Components

Directions: Match the airport components in the first column to the description in the second column. Not all components are found on every airport so, referencing the airport 5010 report and other available resources, identify which items exist on your airport of choice. You will use this worksheet as a guide to help you develop your own Airport Layout Plan.

_____ Runway

_____ Taxiway

_____Terminal

_____ Air Traffic Control Tower

_____ Instrument Landing System (ILS)

_____ Hangar(s)

_____ Ramp

_____ Runway Lights

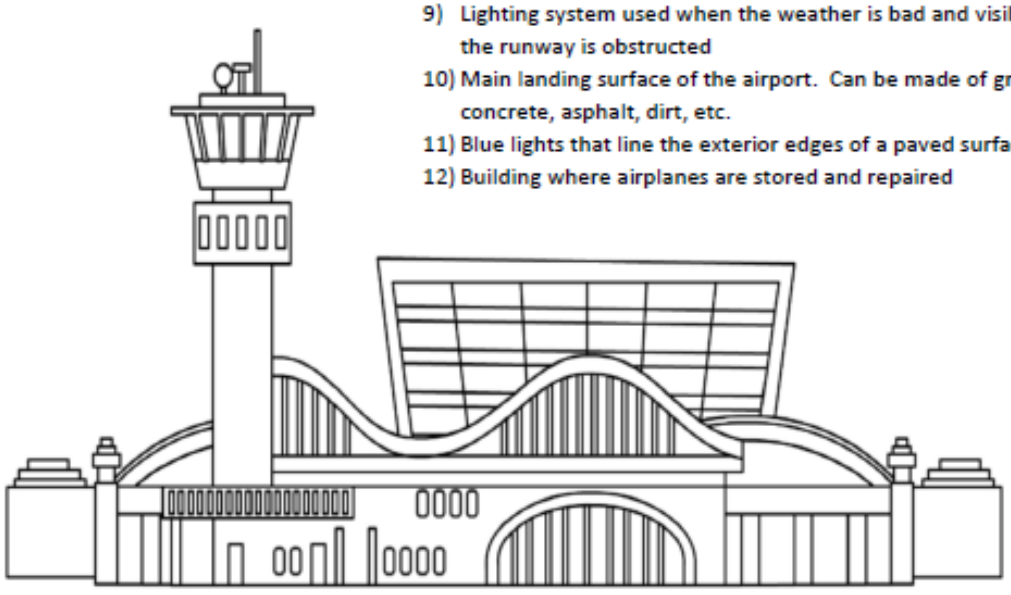
_____ Taxiway Lights

_____ ARRF Station

_____ ASOS or AWOS

_____ Runway Identifiers

1) White lights that line the exterior edges of a paved surface
2) A building made for the enplaning and deplaning of passengers to/from aircraft. May include airport administration offices, restaurants, and other services
3) Automated weather reporting station that captures weather data 24 hours a day
4) Surface used to travel across different parts of the airport. Often smaller and narrower than runways
5) A facility which provides air traffic control services to aircraft operating in the vicinity of the airport both in the air and in the ground movement area
6) Firehouse located on the airport where specially trained fire fighters are trained to respond to aircraft accidents and other emergencies
7) Surface area in front of a terminal or hangar where aircraft park and allow passengers to board
8) Large numbers painted on paved surfaces to direct aircraft during takeoff and landing
9) Lighting system used when the weather is bad and visibility of the runway is obstructed
10) Main landing surface of the airport. Can be made of grass, concrete, asphalt, dirt, etc.
11) Blue lights that line the exterior edges of a paved surface
12) Building where airplanes are stored and repaired



ANSWER KEY

"Airport Layout Plan" Student Worksheet

Name(s)_____ Date_____

Worksheet: Identifying Airport Components

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___10___ Runway

__4____ Taxiway

__2____Terminal

__5____ Air Traffic Control Tower

___9___ Instrument Landing System (ILS)

__12____ Hangar(s)

___7___ Ramp

___1___ Runway Lights

___11___ Taxiway Lights

__6____ ARRF Station

___3___ ASOS or AWOS

___8___ Runway Identifiers

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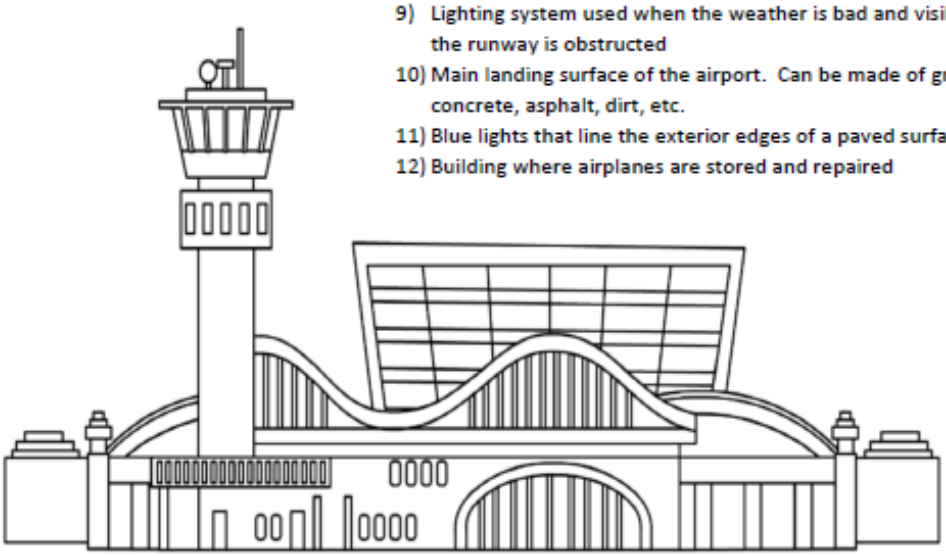
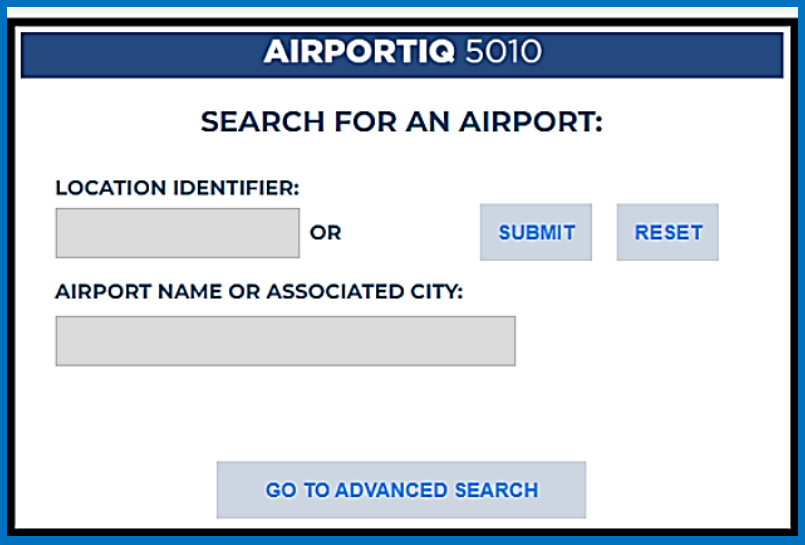


HOW DO I FIND MY LOCAL AIRPORT?

To find airports near you, please visit https://www.airportiq5010.com/5010web/. Conduct your search by inputting your city and then from the results list, you may download the Airport Master Record (Form 5010) to learn all about the size and services available at each airport. As a team, choose which airport you will create. NOTE: Large commercial airports are very big and very complex to draw correctly. In order to be successful with this project, we highly recommend you choose a small or midsize regional airport near your home or school.

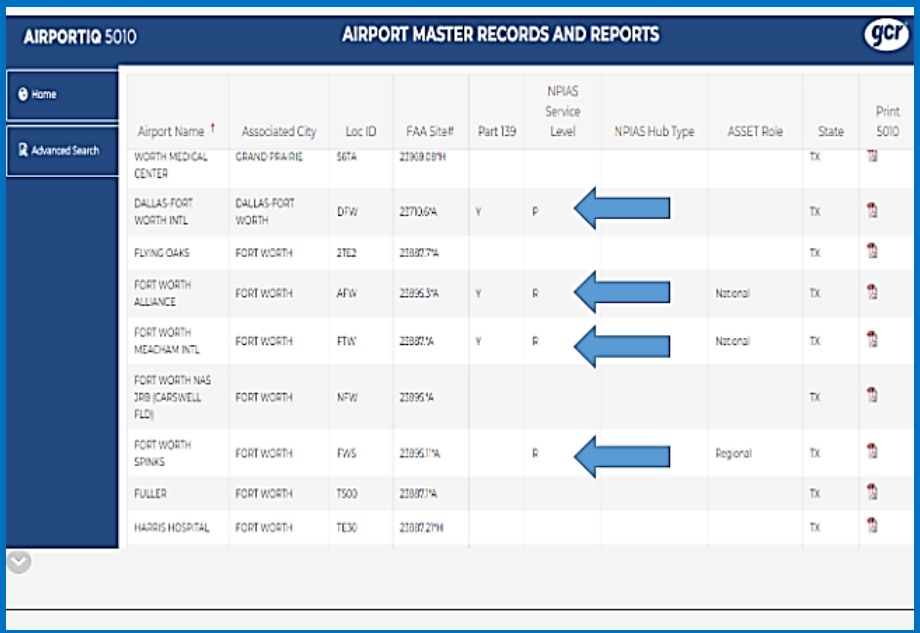
Step 1
Visit https://www.airportiq5010.com/5010web then type in the name of the city where you live.

*NOTE – If searching your city does not provide any results, search using the nearest major city.



Step 2
Look for airports with an initial in the NPIAS Service Level column; choose one to build using Minecraft!

*WARNING – Using non-NPIAS airports will substantially limit your access to important airport information. Please only choose NPIAS airports.



Step 3

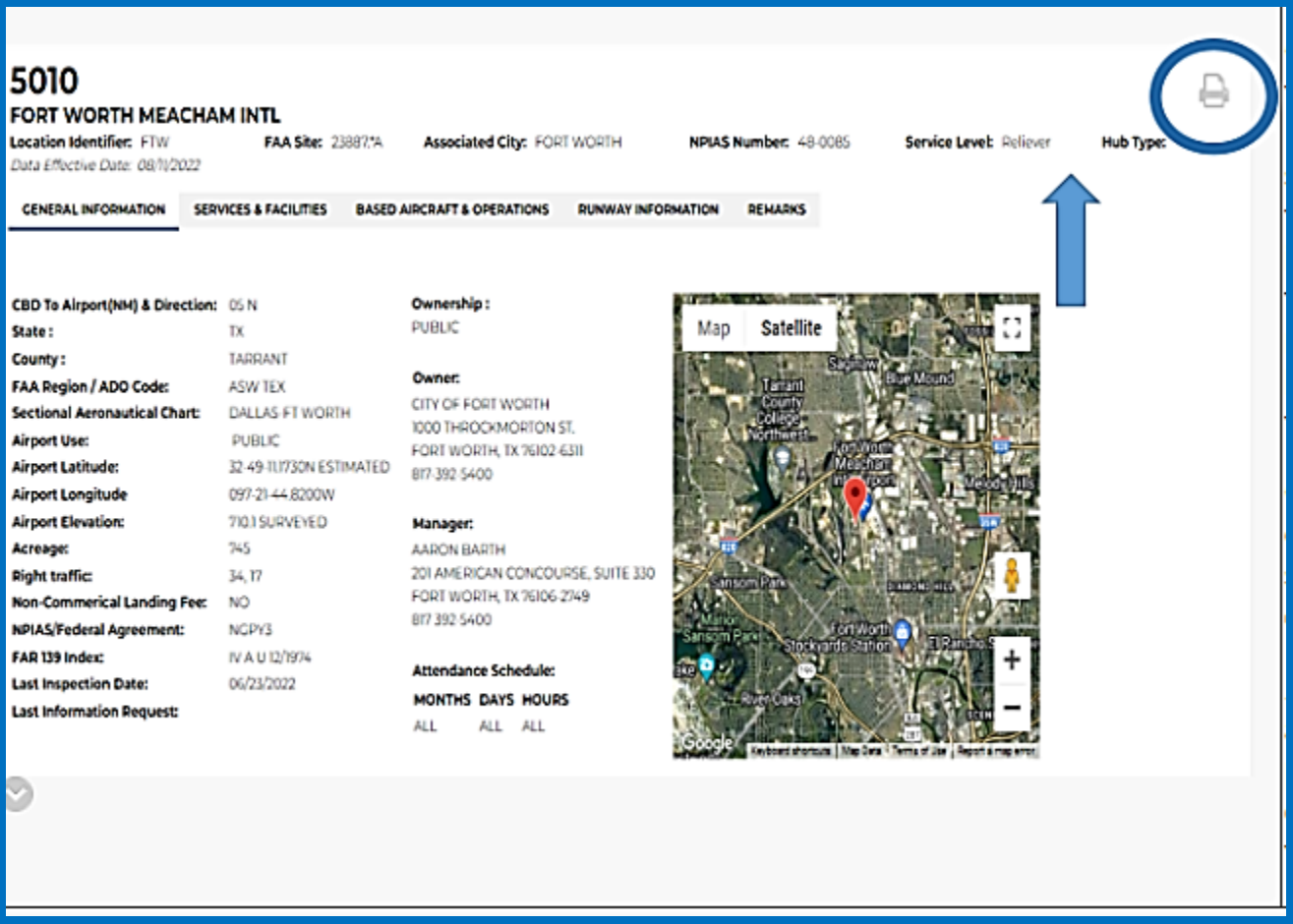
Click the name of the airport to open the Airport Master Record. This record will show you a satellite view of the airport, give you important contact information for the airport manager, and more! The 5010 Form will be VERY helpful to you.

On this screen, you can clearly identify the NPIAS service level and Hub Type of your airport.

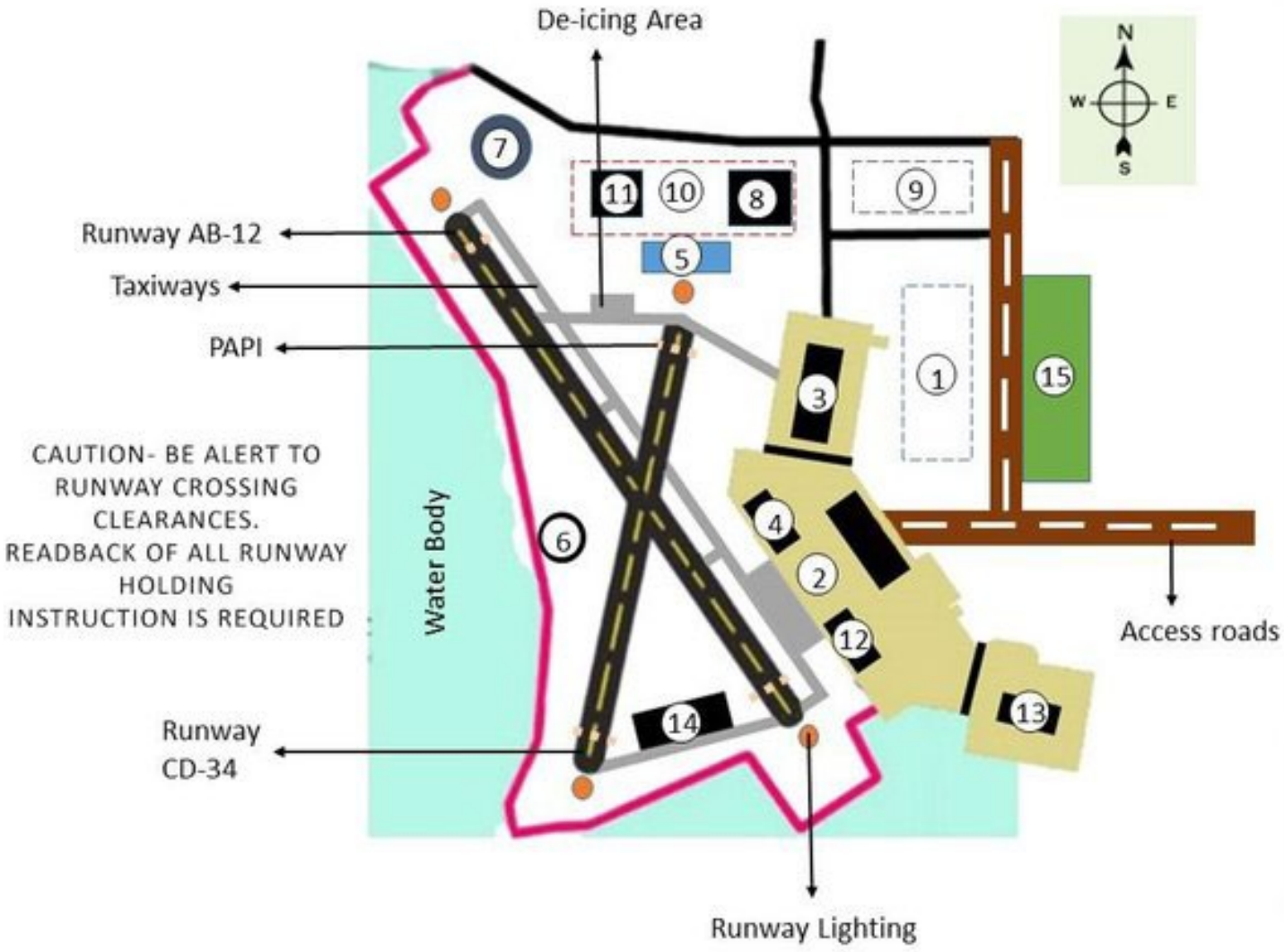
***HINT – After opening the airport record, look for the printer icon to get a downloaded and printable version of the 5010!**

In addition to the 5010 Report, the following sites may be useful in finding satellite views, airport diagrams, and more:

- **www.airnav.com**
- **earth.google.com**



SAMPLE AIRPORT LAYOUT PLAN



1. Parking
2. Terminal Building
3. Maintenance
4. General Aviation Terminal
5. Freight
6. Control Tower
7. Fuel Depot
8. Parking Deck
9. Hangars
10. Apron
11. Ramp
12. Airline Service
13. Ground Maintenance Facility
14. Fire Station
15. Bus Stop

ORGANIZING AN AIRPORT TOUR

Contact the airport manager of the airport and schedule a visit. How do you do this?

- **Option 1-** Go to www.airnav.com and enter the airport name. You will be taken to a web page that lists a variety of information regarding the airport but about halfway down the page you will see the current airport manager's name and their contact phone number.

- **Option 2-** Do a web search using the airport name and see if they have a web page. If so, look at the contact information for the airport. The airport manager is usually one of the first people listed.

- **Option 3-** Stop by the airport and talk to the airport manager in person. This may be the best option if the airport is small and has a limited staff.

Tour directions- Here are some tips to make your airport tour as fun and productive as possible.

- Stay alert! Airports are a wonderful place to visit but there are many areas that could potentially be dangerous due to moving aircraft. Be aware of your surroundings and stay with the tour group.

- Take pictures of everything. As you build your Minecraft airport, these pictures will be helpful in making your airport as realistic as possible.

- Ask lots of questions. Airport managers love showing off their airports and they are a wealth of information about all aspects of what is going on at their field.

- Preplan places you would like to see. This will help the airport manager know what is most interesting to you and allow them time to obtain special permission to bring visitors to the site. Note- there are some areas of an airport that cannot be visited by non-airport personnel but in most cases the airport manager can take you to the outside of the facility and explain what is going on there.

- Have fun!- You will be amazed at all the different airplanes and buildings you will see, even at a small airport.

Are you interested in airport design and learning more about aviation careers near your home? Do you enjoy playing Minecraft? Continue your airport construction journey in the FAA's "Airport Design Challenge"!

Visit our web site www.faa.gov/adc or scan the QR code listed below to learn more and sign up today.