

“IT’S CAKE TIME”

# BUILD YOUR AIRSPACE

USE YOUR IMAGINATION AND BUILD YOUR  
3D HIGHWAY IN THE SKY



## Objective

- Design and build a controlled Airspace model showing Class B, C, and D Airspace. Dissect TAC.

## Materials Needed

- **Computer/laptop/internet**
- **Mobile device**
- **Recycle - Various Craft Supplies/Rulers/Markers**

## Resources:

1. Airspace Examples Video (Page 2)
2. [Airspace Modeling Workbook \(Click to Access\)](#) or see (Pages 3-8)

## Lesson Steps:

1. Teachers, explain and demonstrate how to create an airspace using a model and Airspace map. Identify any C,D, or E airspace within your B airspace for the students to examine.
2. Watch "Airspace Examples" for ideas and pick teams of 3 or 4. 45 MIN  
LESSON
3. Click on the "Modeling Workbook" to help plan out your build. Teams choose their airspace on Skyvector. Students stop after Making a Sketch. 45 MIN  
LESSON
4. Use any type of materials you would like and build your airspace in teams or individually. 6-10 Hours

## Questions to ask:

- How does class B airspace look like an upside-down cake?
- How does Class C, D, & E Airspace look in 3D?
- Where do these spaces start & stop?
- Where is Class G (uncontrolled airspace)?
- What is the difference between controlled and uncontrolled airspace?



**Instructions:**

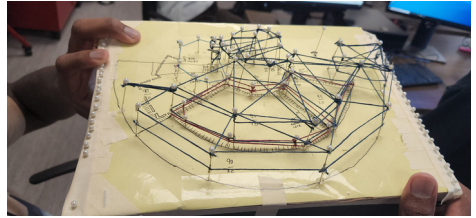
Watch the following video to help get some ideas of how students have created their airspace model



**Build your own  
Airspace Model  
Examples!**



Above: Houston



Above: Honolulu

**Instructions:** Like what you see in the photos above, your team will create a physical model of a Terminal Area Chart. We expect that you do not know much about airspace at this point in your journey. That is okay, because your teacher will teach you the most major concepts that you will need to succeed in this project. Learning these fundamental elements of airspace will make your learning so much easier when you start training for your Part 107.

Your team will choose a major class B airspace to model using various materials of your choice. In addition to modeling the major class B airspace, your team will model other major areas in your airspace including other airspace, towers, checkpoints, and more. You can make the model any size your team wants using whatever materials you decide. You can go big and expensive or small and inexpensive. You could design with 3d model print, pool noodles, toothpicks, Popsicle sticks, or whatever you want. Be creative. We have seen 4 inch models and also 8 foot tall models. Have fun with this. Follow the steps below to plan this out.

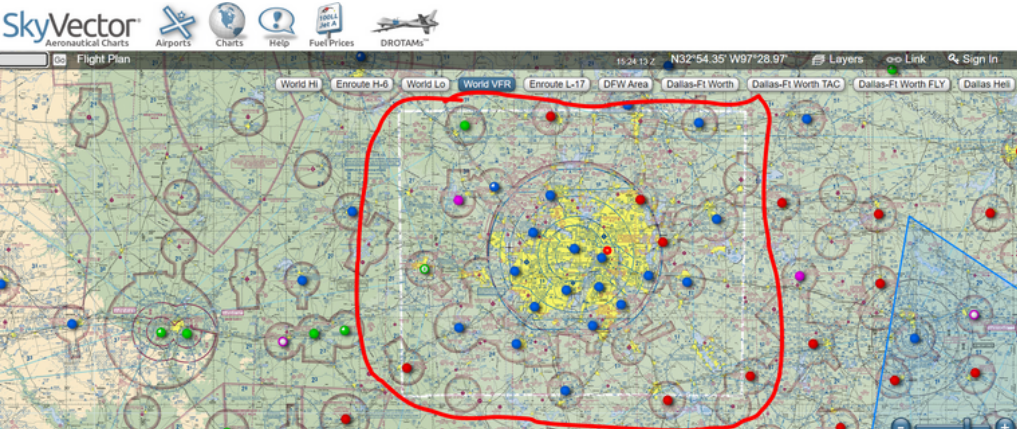
**Step 1: Name of Airspace Model Teammates:**

- A.
- B.
- C.
- D.

## Step 2: Choose your airspace (Use [www.skyvector.com](http://www.skyvector.com))

**Go to Skyvector.com** to see your Terminal Area Chart (TAC) outlined in a white lined box around your major airspace. TAC's are a snapshot of major class B airspace and the immediate surrounding areas. Use this area to identify all the items you will model. Dissect your TAC and know all the details so you can plan your model.

Find your favorite spot, find your home town, find a luxury vacation. Choose, Dissect, Plan, Build! Use the 3 letter code for your airport in Skyvector!



## MAJOR CLASS B AIRPORTS IN THE U.S.A

- Arizona:
  - **PHX** / KPHX Phoenix Sky Harbor International
- California:
  - **LAX** / KLAX Los Angeles International
  - **NKX** / KNKX Marine Corps Air Station Miramar
  - **SAN** / KSAN San Diego International/Lindbergh Field
  - **SFO** / KSFO San Francisco International
- Colorado:
  - **DEN** / KDEN Denver International
- Florida:
  - **MCO** / KMCO Orlando International
  - **MIA** / KMIA Miami International
  - **TPA** / KTPA Tampa International
- Georgia:
  - **ATL** / KATL Hartsfield-Jackson Atlanta International
- Hawaii:
  - **HNL** / PHNL Honolulu International
- Illinois:
  - **ORD** / KORD Chicago-O'Hare International
- Kentucky:
  - **CVG** / KCVG Cincinnati/Northern Kentucky International
- Louisiana:
  - **MSY** / KMSY Louis Armstrong New Orleans International
- Maryland:
  - **ADW** / KADW Andrews Air Force Base
  - **BWI** / KBWI Baltimore/Washington International
- Massachusetts:
  - **BOS** / KBOS Boston-Logan International
- Michigan:
  - **DTW** / KDTW Detroit Metropolitan Wayne County
- Minnesota:
  - **MSP** / KMSP Minneapolis-Saint Paul International
- Missouri:
  - **MCI** / KMCI Kansas City International
  - **STL** / KSTL Lambert-St. Louis International
- Nevada:
  - **LAS** / KLAS Las Vegas-Harry Reid International
  - **LSV** / KLSV Nellis Air Force Base (within the class B surface area of LAS)
- New Jersey:
  - **EWR** / KEWR Newark Liberty International
- New York:
  - **JFK** / KJFK New York-John F. Kennedy International
  - **LGA** / KLGA New York-La Guardia
- North Carolina:
  - **CLT** / KCLT Charlotte Douglas International
- Ohio:
  - **CLE** / KCLE Cleveland Hopkins International
- Pennsylvania:
  - **PHL** / KPHL Philadelphia International
  - **PIT** / KPIT Pittsburgh International
- Tennessee:
  - **MEM** / KMEM Memphis International
- Texas:
  - **DAL** / KDAL Dallas Love Field (lies within the class B surface area of DFW)
  - **DFW** / KDFW Dallas/Fort Worth International
  - **HOU** / KHOU Houston-Hobby (class B secondary airport)
  - **IAH** / KIAH Houston-George Bush Intercontinental
- Utah:
  - **SLC** / KSLC Salt Lake City International
- Virginia:
  - **DCA** / KDCA Ronald Reagan Washington National
  - **IAD** / KIAD Washington Dulles International
- Washington:
  - **SEA** / KSEA Seattle-Tacoma International

**Step 3: Understand what you are expected to model inside your TAC. Here are your rules and guidelines. Teachers, open a random TAC (see below) for your class and point out the identifiers below. DFW is a good example to show. Spend time identifying these on DFW as a class before breaking into teams to work on Step 4.**

1. Your model should be held together by something such as foam board, wood, zip ties, glue, tape, or something that holds your airspace together. *Robo Joe's favorite model is essentially a wind chime with everything dangling from a base with fishing string.*
2. Controlled Airspaces:
  - a. Class B airspace(s) - solid blue lines
  - b. Class C airspace(s) - solid red lines
  - c. Class D airspace(s) - blue dotted lines
  - d. Class E surface airspace - red dotted lines
  - e. Class E 700ft airspace - red magenta
  - f. When modeling your airspaces, the colors of your controlled airspaces should be represented through your material such as paint or pre-colored material.
3. 1 lighted tower - star on top of the tower
4. 1 non lighted tower
5. 1 group/cluster towers
6. 1 lighted group/cluster towers - star on top of the tower
7. Any/all parachute jumps (little parachutes on map)
8. Any/all hot air balloon areas (little balloons on map)
9. Any/all current TFRs
10. Any/all VFR checkpoints (little red flag)
11. Label floor/ceiling of all B and C airspace
12. Label ceiling of Ds
13. Label height of all towers AGL and MSL
14. Make all airspaces proportionate in height and size.
15. !! Your class E starts at 700 feet.. think about how you will suspend or hang that so that it does not go all the way to the surface.

Maybe the wind chime idea is not so bad :)

**Step 4:** Teams, Look for the white box that represents your Terminal area chart. Dissect your area and find all of the items in Step 3. All members must see all identifiers.

**Step 5:** Teams, Plan your build here:

How big will your model be in inches LxWxH? \_\_\_\_\_

What colors will you need the materials to be?  
\_\_\_\_\_

What is your primary material you will use? \_\_\_\_\_

What materials will you use to make your other airspaces?  
\_\_\_\_\_

What materials will you use to make your towers?  
\_\_\_\_\_

What materials will you use to make/symbolize TFRs, VFR checkpoints, towers, etc..? \_\_\_\_\_

How will you label your floors and ceilings?  
\_\_\_\_\_

How will you make sure all sizes of each modeled item are proportionate in size to other items in your model?  
\_\_\_\_\_

What are you bringing to build with? Teammate #:

1.Items to bring: \_\_\_\_\_

2.Items to bring: \_\_\_\_\_

3.Items to bring: \_\_\_\_\_

## Step 6: Make a 3D sketch

- Make a sketch of your model or a sideview sketch so your team can visualize how you will build. Label all airspaces, height and width of each airspace, AGL/MSL of each tower or group of towers.

SKETCH IN 3D

CLICK TO WATCH THIS SIMPLE COOL VIDEO TO LEARN HOW TO SKETCH 3D

## Step 7: Build It

1. Day 1, we completed \_\_\_\_\_
2. Day 2, we completed \_\_\_\_\_
3. Day 3, we should be finished, but we still need to \_\_\_\_\_
4. Day 4, we present!





## **Step 8: Present it to your teacher and classmates**

Teacher Summative Rubric-

- Creativity in size/materials 10%
- Proportionate size of items 10%
- Class B built 10%
- Class C,D,E built 20%
- Towers, VFR checkpoints, TFRs 15%
- Labeling of height, ceiling, and floors of all airspace, towers, etc..15%
- Make a short video under 5 minutes (using mobile device and free app editing) that is fun, lighthearted, and/or funny video to highlight all the points.. 10%
- Show the video in class 10%