



The Stair Master!

It has come to the attention of school administrators that some buildings are experiencing higher **humidity** levels than are considered safe and this could indicate a problem with building Heating, Ventilation, and Air Conditioning (**HVAC**) systems.



Because of your experience with data collection and drone piloting skills, you have been hired to do a **humidity** survey of several building areas. Your mission is to use a drone, carrying databot™, to take **humidity** readings at precise heights, every one meter, in certain rooms for analysis. Plan on practicing your ability to control your ascent in one meter increments with precision. This mission should be done with a partner where one individual pilots and the other handles the data science role monitoring sensors.

Why is Humidity of Concern?

Indoor air quality guidelines recommend a **relative humidity** level of between 40%-60% for comfort and health. Above 60% is considered potentially hazardous and can stimulate mold growth that produces **allergens** (substances that can cause allergic reactions) and irritants that can be harmful to individuals. Since warm air rises, **humidity** levels are sometimes higher as you move up. A second story in a house may be considerably more **humid** than the first floor. Proper **HVAC** systems regulate for this!

PDOQ: Humidity Hunter

Do this activity as a team of two. One teammate will be the spotter, watching and calling the data out to guide the pilot to ascend and hold altitude in one meter increments. The pilot is responsible for flying with precision based on the cues provided by the data scientist. To collect the **humidity** data required for this mission, precise elevation changes are required!

- Carefully mount your databot™ on your drone. Use the 3D printable mount provided if you are using a Tello.
- Tap on **The Stair Master** in Vizeey™ to load the experiment. Use the   icons to start and pause the experiment. Clear your data before each measurement run.
- Practice: Pilot:** practice your ascent several times using the "Main" view in Vizeey™. The goal is to increase your elevation in one meter increments and hold each incremental altitude for five seconds to gather **humidity** data. Excellent piloting will produce a data graph of ascent that looks like a set of stairs.
Data Scientist: using the commands "hold altitude" and "ascend" coach the pilot carefully through the ascent. Be sure to watch the proximity sensor data also to keep the pilot from hitting the ceiling!
- Final Run:** After practicing, clear all experiment practice data and commence your final run using the "Environment" view to watch **humidity** data. Halt the recording at your peak ascent level and export it for analysis and to produce a final report for your client. Your final report should show **humidity** levels corresponding to each altitude and highlight any areas of concern that are above 60% humidity. Hopefully all is safe!

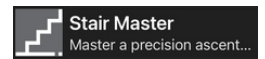


Drone
Proximity Sensor
Altimeter
Humidity

Grades: 4 & Up
Time: 15 Minutes
Subject: Physics, Technology, Drones
Topics: **Altitude, Precision, Humidity, Air Quality**

What You Will Need/Prep

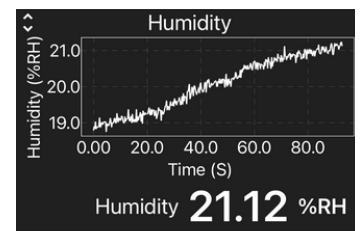
- databot™ 2.0 & Vizeey™
- IOS/Android Smart Device
- Drone (Tello or larger)
- A method to top mount databot™ on the drone.
- Read the Vizeey™ Fast Start Guide and install Vizeey™ if you haven't already.
- Do the **Humidity** Sensor Starter and calibrate to your local **humidity**.
- Use Vizeey™ to scan this QR code and get started.



*For Tello Users,
download the free 3D
printable mount for
databot™. Download the
zip file here.*



Use the Main view to practice your ascent stages. Does your data look like stairs?



Humidity values may increase with altitude, do your values increase in this experiment?