# Educating Chapman University about Air Quality

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## INTRODUCTION

**Particulate Matter**

- Particulate matter (PM) refers to the mixture of solid particles and liquid droplets found in the air. Particulate matter can come from primary particles, which are particles directly released into the atmosphere, or it can come from secondary particles, which are formed in complicated chemical reactions in the atmosphere.
- Particulate matter can either be *coarse* or *fine*. Coarse PM particles are larger than 2.5 mm but smaller than 10 mm, whereas fine PM particles are less than 2.5 mm in diameter.


*Figure 1: Shows size of PM compared to other small objects.*

## EFFECTS OF POOR AIR QUALITY

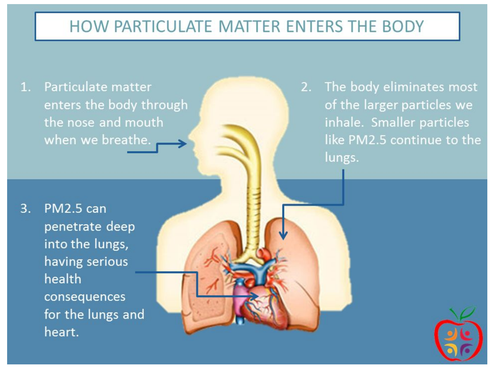



*Figure 2: Shows how particulate matter enters the body.*

### Health Effects

- Heart Attacks
- Aggravated Asthma
- Decreased Lung Function
- Airway irritation
- Irregular Heartbeat
- Increased risk of dementia

### Environmental Effects

- Depletes nutrients in soil, causing to damage farm crops
- Makes lakes/streams acidic
- Affects the diversity of ecosystems
- Adds to acid rain effects

People usually think air quality indoors is better than outside. However, the levels of indoor air pollutants can often be 2 to 5 times higher than outdoor levels. Therefore, we believe that people need to be educated to protect themselves.

## OUR WORK

- Our goal is to bring awareness and educate the general population about indoor air quality and the harmful effects that high particulate matter (PM) concentrations can have on us.
- It is important to learn about indoor air quality because there is statistical evidence that shows indoor air quality can be worse than outdoor air quality.

**What we have accomplished:**

- We have developed a website that displays the effects that indoor air quality may have on us and information about the air quality inside various school buildings that is updated in real time.
  - Our website includes information about what particulate matter is and the effects that it can have on us
  - There is data considering the particulate matter levels throughout our sensors on campus. The data from inside Hashinger Science Center, inside Keck Center for Science and Engineering, and one outside of the Keck Center are set up to display live levels of particulate matter in the air.



COVID-19's Effects On Air Quality:

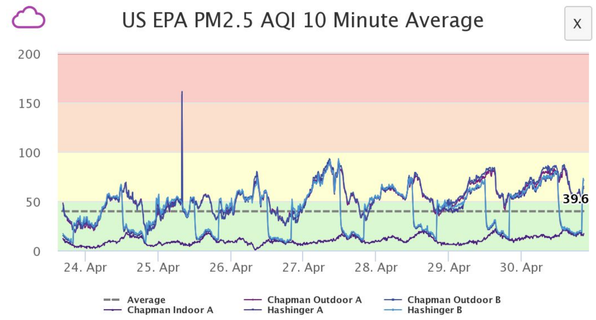

Our New Goals Since Moving Online:

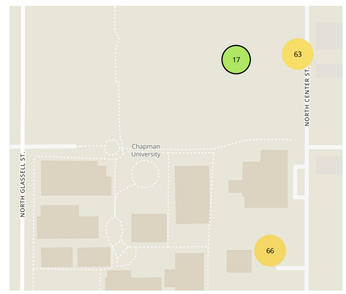
Now that we have to have more of a presence online with our project, we have taken time during this semester to focus on our data collection from the PurpleAir sensors and our ability to display that on this website. Obtaining this data has been important, especially during this time where students have not been on campus and less companies have been consistently polluting the air. As seen on the graph below, since the sensor was set up, these levels displayed on the graph since social distancing was encouraged have been the lowest recorded.

US EPA PM2.5 AQI One Day Average

- To collect data about the air quality in our school's buildings, we are using PurpleAir sensors.
- PurpleAir is an air quality monitoring network that uses laser particle counters to measure particulate matter concentration in the environment.

- The PurpleAir sensors allowed us to obtain data about the air quality in the buildings at Chapman.




## FUTURE GOALS

- Set up more sensors throughout campus to collect more data on the indoor air quality of our school.
- Display the data with the effects of particulate matter in Chapman University's facilities on electronic billboards around campus
- Create proposals for promoting better air quality inside and outside facilities on campus

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