

Name _____

Measuring Particulate Matter in the Classroom

Connecting the AirBeam Sensor to the AirCasting App:

1. Turn on the AirBeam1. You'll know it's on when the red LED indicator begins blinking.
2. Turn on the android tablet or phone. Open the AirCasting app.
3. Press the menu button, then press Settings.
 - Press External devices, then select the AirBeam1 unique ID# (# will be on the AirBeam itself) from the list of paired devices. When prompted to connect, press Yes. You will then be redirected to the Sensors Dashboard.
4. In 5-20 seconds, measurements from the AirBeam will appear on the screen and the blinking red light on the AirBeam will switch to solid red. You're connected!

Data

Source (ex. candle)	PM 1.0 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	PM 10 ($\mu\text{g}/\text{m}^3$)

Which source had the highest level of any type of particulate matter? _____

Why do you think this is? _____

What kind of particulate matter (PM 1.0, 2.5, or 10) had the greatest amount? _____

Why do you think this is? _____

Team Members: _____

Measuring Particulate Matter in the School Community

My group's air testing route:

Insert Google map of the school community here.

Data

Location Number	PM 1.0 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	PM 10 ($\mu\text{g}/\text{m}^3$)	Additional Observations Ex: school bus, vent, car, etc. how close is the sensor to the source?

Location Number	PM 1.0 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	PM 10 ($\mu\text{g}/\text{m}^3$)	Additional Observations Ex: school bus, vent, car, etc. how close is the sensor to the source?

Additional observations:

How windy is it? _____

Temperature: _____°F Relative humidity: _____%

Analysis Questions:

1. Was the PM level on your route higher, lower, or close to what you were expecting?

2. Where were particle levels highest? _____

What is causing the PM level to be so high here? _____

3. Where were the particle levels lowest? _____

Why do you think this was? _____

4. Do you think the time of day or season affected your results? _____

Why or why not? _____

5. Where do you think most of the PM near the school is coming from? _____

Conclusions: How healthy is the air near the school?

When particulate matter levels get too high, they can be dangerous to our health. The chart below from the US Environmental Protection Agency (EPA) shows how healthy the air is based on the amount of PM2.5 and PM10. Keep in mind that these numbers are based on more than just one reading. They are based on the average amount of PM measured over a whole day.

	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy
PM 2.5	0 – 12.0 $\mu\text{g}/\text{m}^3$	12.1 – 35.4 $\mu\text{g}/\text{m}^3$	35.5 – 55.4 $\mu\text{g}/\text{m}^3$	55.5 -150.4 $\mu\text{g}/\text{m}^3$
PM 10	0 – 54.0 $\mu\text{g}/\text{m}^3$	55 – 154 $\mu\text{g}/\text{m}^3$	155 – 254 $\mu\text{g}/\text{m}^3$	255 – 354 $\mu\text{g}/\text{m}^3$

What is the PM2.5 level for the day you in your area (in $\mu\text{g}/\text{m}^3$) measured by the closest sensor? _____

You can find this information at: <https://www.iqair.com/air-quality-map> or by talking to your teacher

According to the chart, how healthy was the air? _____

How does the PM2.5 levels you measured compare to this? Are your readings higher or lower or a mix of the two?

Why do you think your readings might be different than the readings from the sensor? _____
