

Breathtaking Technology!

Environmental Study of Air - Technology

Essential Question	<i>How is technology used to improve air quality?</i>
Outcomes	<ol style="list-style-type: none"> 1. Students will be able to identify and explain technologies used to improve air quality. 2. Students will use research evidence to gather information and make predictions on technologies used to improve air quality.
Standards Benchmarks identified in RED are priority benchmarks.	<p>Science Assessment Targets</p> <p>ES.a.2 Natural hazards (e.g. earthquakes, hurricanes, etc.) their effects (e.g. frequency, severity, and short-and-long-term effects) and mitigation thereof (e.g. dikes, storm shelters, building practices).</p> <p>ELA Content Standards</p> <p>R.4.10. Integrate information presented in different media or formats (e.g., in charts, graphs, photographs, videos, or maps) as well as in words to develop a coherent understanding of a topic or issue.</p> <p>L.6.1. Determine or clarify the meaning of unknown and multiple-meaning words and phrases, choosing flexibly from a range of strategies.</p> <ol style="list-style-type: none"> a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. <p>W.6.3 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation (W/WHST 11-12.7.)</p> <p>W.6.4. Draw evidence from literary or informational texts to support analysis, reflection, and research.</p> <ol style="list-style-type: none"> a. Apply Reading standards from this level to literature (e.g., "Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone").

	S.4.4. Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation. (SL.8.4)
STEM Focus	<input type="checkbox"/> Science <input checked="" type="checkbox"/> Technology <input type="checkbox"/> Engineering <input type="checkbox"/> Mathematics

TEACHERS: this content was designed for ABE/ASE students. Instructional scaffolding used in this lesson can be beneficial for multilingual students.

Because adult classrooms are multi-level, teachers will want to differentiate this HyperDoc by accommodating the different ways that students learn by using scaffolding strategies and appropriate leveled materials. Teachers will want to vary the instructional activities based on their student's needed skills.

For more information about collaborating and sharing on Google Drive, check out videos 36-45: [Google Junior Training series - YouTube](#).

STUDENTS: Before you begin this lesson



- Go to File > Make a copy
- Change the name to: <your name> Air Technology
- Begin working in your document
- When completing an activity, make a copy of the document and save with your name and the title of the activity

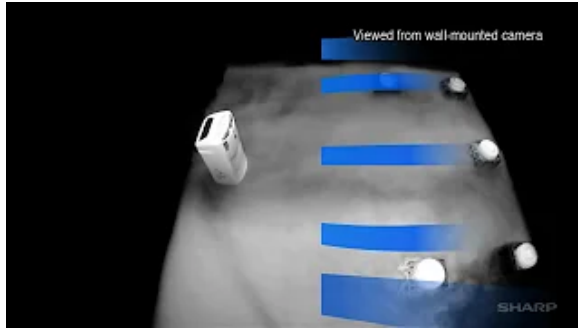
Be sure to read carefully. The green text is a prompt for reflection or activity.



Engage

Have you ever wondered what technology is used to improve air quality? Some call it cleaning or purifying air.

Watch the video below by clicking the image, then answer the questions on the right.



Air Purifier Demonstration (2:35)

What did you observe happening in the video?

Was technology used? How?

Would you say that humans have a natural air flow technology? Why or why not?



Explore

Click the image below to review the slide show. Explore the necessity of air flow technology :



What are some reasons that humans might want cleaner air indoors?

What are some risks to not using air technologies such as air purifiers?

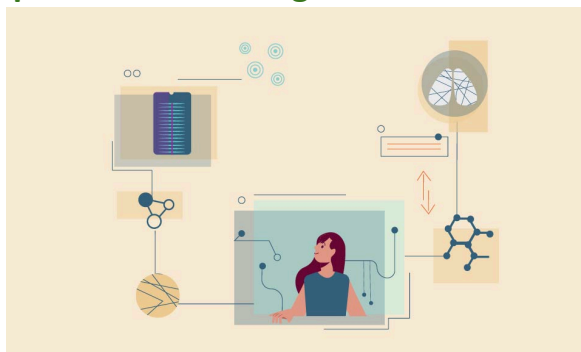
Explain

Read to learn new vocabulary:

Air purifiers improve the quality of the air you breathe, as implied by their name. Although their common goal is to eliminate harmful substances from the air, there are many viable methods that use technologies to accomplish this, including mechanical filtering, ionization, and chemical methods.



Click the image below to learn about these methods, then answer the questions on the right:



Explain what the technology of *mechanical filtering* consists of:

Explain what the technology of *ionization* consists of:

What does the technology of cleaning the air using *chemicals* do?

Predict:

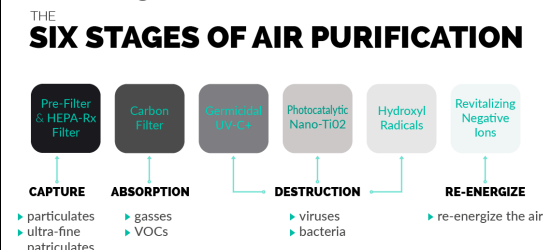
What might happen if this technology didn't exist?



Elaborate

Scroll the site:

<https://surgicallycleanair.com/core-technologies/> to learn of the various places that use premium indoor air purification technologies.



List:

List 12 industries from the site that use technology to improve air quality.

1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.



Collaborate

Read:

Proper ventilation in your living area may prevent illnesses and reduce transmission of viruses. But can portable air cleaners and purifiers fight COVID-19? Dr. Gregory Poland, a Mayo Clinic infectious diseases expert, says that they generally can. "The more air exchanges and the cleaner the air, the lower the risk," says Dr. Poland. "By itself, it's not satisfactory, so what we're doing, as we've talked about over the months, is we're layering protections. Let's be sure the air in our home, if we're having people to our home, is as safe as it can be. That means a HEPA (high-efficiency particulate air) filter."

Click the image below to watch Dr. Gregory Poland talk about high-efficiency particulate air filters and COVID-19:



Dr. G. Poland-Can a Home Purification System Help Fight COVID (1:32)

Research:

With COVID 19 safety measures becoming and remaining crucial, you will **conduct research using data** to determine ***how the world is using air purification technology to fight the COVID virus.***

Work with a partner or small group and follow these steps:

1. Choose a country impacted by COVID-19.
2. What is a major business in that country that uses strong, clean air measures (technologies) in order to operate?
3. What data supports that the business uses clean air technologies? Look for numbers, statistics, charts and/or graphs.

Possible businesses: schools, daycares, airports, banks, hospitals, grocery stores/markets, spas, resorts, cruise lines, train stations

Possible search terms: countries impacted by COVID-19, businesses around the world that use clean air technology, air purifiers

What type of business did you research?

What is the country where this business is located?

How does this business use air cleaning technology to fight against COVID? Include data for evidence.

Create a video to share your research. In the video:

1. Discuss what you found out about your chosen country of research.
2. Talk about the clean air technology used to fight COVID and
3. Why it is important for that business to maintain clean air.
4. Decide as a group, who will do the video. Will it be interview style? Reading from notes? One presenter or more in the video?

How to make the video:

- Click on the FlipGrid link below to access the site.
- Click "Enter your guest password". The **password is Technology.**
- Press "Record a Response" (You'll have up to 3 minutes to record)
- Click on "Effects" to play with filters and stickers.
- Record
- Once done, click, submit.

Have fun! Feel free to explore filters and stickers prior to recording.

Click the link below when you are ready to record:

→ [FlipGrid Link](#)

Password: Technology



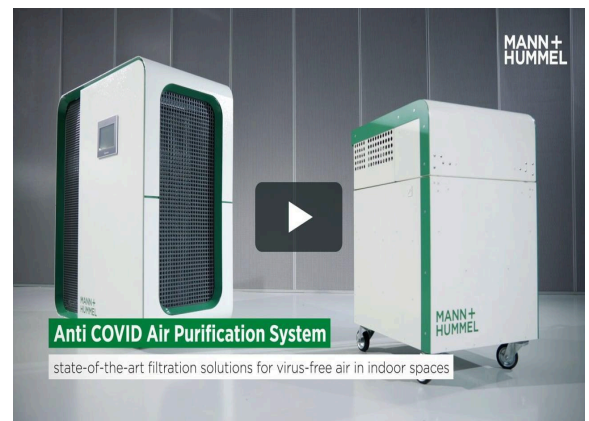
Evaluate

Read this Assessment Prompt:

You own a small daycare center that employs 10 adults and serves 80 children daily. Based on what you have studied about purifying the air, *what technologies would you use to keep your childcare business safe?*

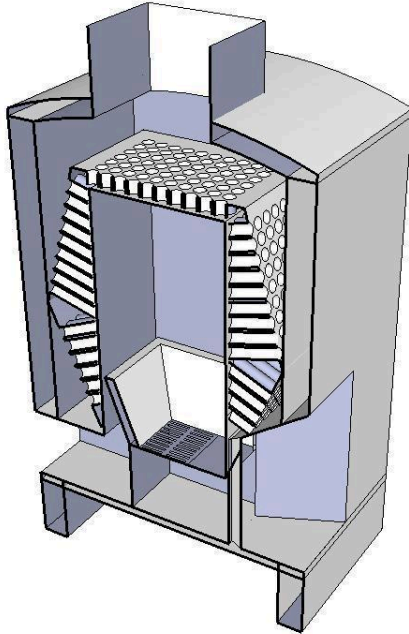
Use the above scenario to answer your air technology assessment questions. Also, consider using your readings, notes, research, observations of videos and the slide show to answer your question.

Click the image below to begin your Air Technology Assessment:





Extend



Watch this: Videos

[8 Ways to Clean the Air in your Home using technology](#)
[Clean Air Machines](#)

Read this: Articles

<https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/ventilation.html>

<https://www.epa.gov/clean-air-act-overview/clean-air-act-solving-air-pollution-problems-science-and-technology>

<https://www.epa.gov/coronavirus/air-cleaners-hvac-filters-and-coronavirus-covid-19>

<https://newsnetwork.mayoclinic.org/discussion/can-a-home-air-purifier-system-protect-you-against-covid-19/>

<https://cen.acs.org/biological-chemistry/infectious-disease/air-purification-technologies-tackle-COVID/99/i9>