

## Healthy Spaces

### OBJECTIVES

Students will:

- Understand the meaning of *healthy space*.
- Explore the elements of environmental quality.
- Analyze the health of their learning environment.
- Communicate innovative suggestions via persuasive writing.

### DURATION

Two class sessions of approximately 45 minutes each

### OVERVIEW

With this set of resources, students will be introduced to Trane Technologies' Center for Healthy and Efficient Spaces (CHES) and explore what elements are considered when evaluating a space for environmental quality. Students will apply these elements to their school setting and work to develop a "pitch" with suggestions for potential innovations to increase the environmental quality of their learning environment.

### BACKGROUND<sup>1, 2, 3</sup>

The quality of indoor environments is assessed based on four pillars: temperature, lighting, air quality, and acoustics. Trane Technologies has been pushing forward in the world of Indoor Environmental Quality (IEQ) with the goal of helping people feel safe and comfortable in their spaces. With the understanding that healthy indoor spaces must be good for people and for the planet, Trane Technologies employs strategies and approaches that emphasize sustainability. Forming the Center for Healthy and Efficient Spaces (CHES), they have brought together internal and external experts to establish a roadmap for more resilient communities and spaces. Focusing on innovation, collaboration and insights, and policy and standards, Trane Technologies aims to create healthy spaces for private citizens as well as in the fields of medicine, business, and education.

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<sup>1</sup> <https://www.tranetechnologies.com/en/index/sustainability/sustainable-indoor-environments.html>

<sup>2</sup> <https://www.tranetechnologies.com/en/index/sustainability/sustainable-indoor-environments/center-for-healthy-and-efficient-spaces/resources.html>

<sup>3</sup> <https://www.tranetechnologies.com/en/index/sustainability/sustainable-indoor-environments/center-for-healthy-and-efficient-spaces.html>

## MATERIALS

### All Sessions

- Computer with ability to project, one for educator

### Session 1

- Sticky note or small square of paper, one per student
- Highlighter, one per student
- **Video Transcript** student handout, one per student
- **Important Elements of IEQ** student handout, one per group
- **Session 1 Exit Ticket** student handout, one per student

### Session 2

- **Video Transcript** and **Important Elements of IEQ** handouts from first session
- Lined paper, one per group
- **3-2-1 Exit Slip** student handout, one per student

## USING THIS GUIDE

The goal of this guide is to give educators a complete set of resources for facilitating lessons on environmental quality. It provides slide-by-slide instructions to ensure educators are prepared to explain, discuss, and facilitate the hands-on content in the presentation. The presentation is designed to cover two class sessions, but it can be flexible depending on the students' needs and the time available. However, sessions should be presented in order.

The accompanying presentation was created with PowerPoint so that it can be used in a variety of classrooms. If you are using a laptop with a projector, simply progress through the PowerPoint by clicking to advance. All of the interactive aspects of the presentation are set to occur on click. This includes images, text boxes, and links which will appear in your web browser. If you are using an interactive whiteboard, tap each slide with your finger or stylus to activate the interactive aspects of the presentation. Notes for each slide provide information on how to proceed.

## PROCEDURE

### Session 1 (Slides 1–6)

**Overview:** Students learn about CHES and analyze a video transcript from [Indoor Environmental Quality in Daily Life](#) to discern the essential elements considered in evaluating environmental quality.

### Slide 1

- As you distribute a sticky note to each student, direct students' attention to the question at the top of the slide: "What makes an environment or space *healthy*?"

- Click to display the “snowball fight” screen. Tell them that when you say “go,” you will start the 30-second timer. They will have 30 seconds to write their answers to the question on their sticky notes, crumple them up, and throw them towards you in the front of the room.
- Click to start the timer.
- When the timer sounds, collect the “snowballs” and begin reading them, as many as time allows.

#### Slide 2

- Reveal the information about “healthy spaces,” and read the elements considered by CHES when creating a healthy space.
- As a class, discuss whether any of the “snowballs” came close to the elements. Acknowledge if any were *examples* of a healthy space.

#### Slide 3

- Explain that an acronym used in the industry to describe environments and spaces is IEQ—Indoor Environmental Quality.
- To achieve a high IEQ and be considered a “healthy space,” it must be good for people *and* the planet.

#### Slide 4

- Distribute a highlighter and a copy of the **Video Transcript** handout to each student.
- Instruct students to read along silently as you play the video. When they hear/read something they feel is vital to assessing the quality of an indoor environment, they should highlight that portion of the transcript.
- Click once to start the video automatically.
  - If video does not play, be sure to exit presentation mode click the Enable Content button.
- When the video is over, ask 2–3 volunteers to share something that they noted.
  - **Note:** *If students had trouble following the video while also reading along, take a few moments to go through the transcript to allow them to note important elements.*

#### Slide 5

- Divide students into groups of three or four and instruct them to bring their **Video Transcripts** to their group’s meeting place.
- Distribute an **Important Elements of IEQ** student handout to each group. Give groups 30 seconds to assign a recorder whose job it will be to write the group’s thoughts and ideas on the handout.
- For approximately ten minutes, allow students to discuss what they highlighted on their transcripts and together decide on the four elements they believe are most important when analyzing or building a healthy space. The recorder should list these elements in the first column or the chart.

- **Note:** *Students may be inclined to write down the four pillars featured in the video. This is acceptable, but encourage them to also consider the elements presented on slide 2 and their own priorities in making their list.*

### Slide 6

- Preview the next session by informing students that they will be using these priority lists of IEQ elements to analyze their learning environment and their school and make suggestions for possible innovations.
  - **Note:** *Depending on the time between sessions, it might be helpful for you to collect all handouts and redistribute during the next meeting so students do not misplace them.*
- Distribute a **Session 1 Exit Ticket** to each student in the last minutes of class. Collect as they leave and review before the next session.

### Session 2 (Slides 7–11)

**Overview:** Students will first audit their school setting according to the identified elements before deciding if there is room for improvement for each. Then, they will work in cooperative groups to develop a “pitch” suggesting potential innovations.

### Slide 7

- Briefly review what was covered in the first session.
- Use this time to correct any misconceptions or answer any questions that came up while reading through the students’ **Session 1 Exit Tickets**.

### Slide 8

- Organize students back into the groups they worked with during the first session and distribute handouts accordingly if you collected them. Give students one minute to review the handout and the four essential elements they chose.
- Direct students’ attention to the second column titled, “Current Status.” Explain that they will be assessing their school’s current condition to see where it stands with regards to each element on their handout.
  - **Note:** *You can choose to have students stay seated in the classroom and discuss what they’ve seen observed in the school, or you may choose to walk the students around the school to make observations.*
- Give groups ten minutes to discuss each element. The recorder should write notes in the appropriate box.
- Click to begin the timer.

## Slide 9

- Direct students' attention to the final column on their handout, "suggested changes." Based on what they have learned in the two sessions and the information provided in the **Video Script**, what suggestions can they make to the school to improve their indoor learning environment.
  - **Note:** *If students believe that the school has already accomplished positive steps regarding a certain element, they can note that.*
- Again, give groups ten minutes to discuss and record their suggestions. Click the timer to begin.

## Slide 10

- Inform students that they are going to use what they have learned and the suggestions they have brainstormed to try to effect real change. They will be writing a persuasive letter to the school administration encouraging them to make changes to improve the IEQ at the school.
- Click to reveal the heading. Explain that in their letter, they must include the following elements.
- Click again to show the required parts of the letter and briefly explain each one.
  - **Note:** *This list can also be used as a rubric if letter will be assessed for a grade.*
- Tell students they will have ten minutes to complete their letter. When the class is ready, click to begin the timer.

## Slide 11

- Collect letters and reinforce how important it is to advocate for change when it is needed.
- Distribute one **3-2-1 Exit Slip** to each student to complete before the end of the session.
- Collect the handouts as students finish them. If time allows, choose a few questions that remain and discuss with the group. As you are able, follow up with students regarding their exit slips after the conclusion of the series.

## NATIONAL CONTENT STANDARDS

### STEM

#### Next Generation Science Standards (NGSS)

- [MS-ESS3-3](#): Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

### ELA

#### Common Core State Standards (CCSS)

- [W.1](#). Introduce a topic clearly and state an opinion providing logically ordered reasons that are supported by facts and details.
- [W.7](#). Conduct short research projects that use several sources to build knowledge.
- [SL.1](#). Engage effectively in a range of collaborative discussions.
- [SL.6](#). Adapt speech to a variety of contexts and tasks.

#### Science and Engineering Practices

- [Asking questions and defining problems](#)
- [Constructing explanations and designing solutions](#)

## INDOOR ENVIRONMENTAL QUALITY IN DAILY LIFE

Now, more than ever before, people are spending most of their time inside.

There is unmistakable evidence that healthier indoor spaces are good for people and efficient spaces are better for the planet.

We've innovated for decades to create cleaner, more comfortable, and more efficient places for you to live and work.

Whether it's homes, schools, offices, public transit, or any other dynamic space—Trane Technologies works shoulder to shoulder with businesses and our communities to sustainably create the healthiest, most efficient environments possible—with no trade-offs.

The way you feel, and function indoors is the result of many things existing harmoniously. Each one is critical, so we figure out how they work together and dynamically optimize them to meet the needs of anyone inside.

Getting your day started is something sacred. It's where you set yourself up for everything in front of you—it's where you focus, pet a furry friend, and leave a little encouragement for loved ones before you get to work.

Trane Technologies is right there with you—leveraging geofencing technology and sensing devices to dynamically optimize your environment regardless of where you are.

Because no one can gear up for a big day if you're not comfortable. But as we know, the comfort of home is not usually the only place you are.

Each space you enter has a different effect on our safety, our comfort, and our planet. Public transport is a unique part of any day. You're in it less but surrounded by more.

Feeling safe and healthy on your way to and from work is paramount. We get that. That's why Thermo King offers the safest, most effective solution that works in the background to reduce the spread of pathogens by sanitizing incoming air and stopping viruses, bacteria, and contaminants from entering the passenger areas.

So, keep that mask on and know that we're doing our part too.

We've all got varied and complex things to accomplish throughout the day. Air quality is a foundational element in creating and maintaining healthy and safe indoor spaces. When air quality is improved, we take notice. But it's important to address the rest of your environment so you can feel productive and passionate about what's in front of you.

Poor lighting and bad sound design also have an enormous influence, impacting you in ways you may not realize.

Trane Technologies uses time controlled, human-centric lighting sequences that vary color temperature, intensity, and other scientific variables. It's tied to our natural circadian rhythms so you can be the right kind of productive when you need to be. That's an impact you can feel—and quantify.

The ability to learn and our overall cognitive growth is directly affected by the acoustics of the spaces we're in. Trane Technologies manages the acoustical quality of the commercial HVAC system, allowing the right amount of ambient sound to keep you focused and let the creativity flow.

The indoor spaces we inhabit are as diverse and unique as we are.

Today, we're managing for better environments.

Tomorrow, a healthier planet for all.

Source: <https://www.tranetechnologies.com/en/index/sustainability/sustainable-indoor-environments/center-for-healthy-and-efficient-spaces/resources.html>



IEQ ELEMENT	CURRENT STATUS	SUGGESTED CHANGES

EXIT TICKET

Name:

Summarize today's session in only one sentence:

Something I still don't understand about today's session is:

What are the THREE new things you learned about healthy spaces?

1.

2.

3.

What are TWO things you are interested in researching or learning more about?

1.

2.

What is ONE question you still have about something you learned?

1.