Indoor Environmental Quality
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COURSE DESCRIPTION
Students explore issues related to indoor environmental quality in buildings. They examine the areas of air quality, acoustics, and lighting and learn why buildings can become “sick.” Then, they learn how buildings breathe and what sustainable strategies, technologies, and policies exist for improving indoor environmental quality. The hands-on audit invites students to assess the school’s indoor air, light, and sound quality. They start first with their own classroom, and then apply their process to evaluate large communal areas around the school.

Lesson 1: The Air We Breathe
In this lesson, students discover that the classroom air they breathe is comprised of an astounding variety of microscopic ingredients. By studying the various components that make up their physical classroom, and the extent to which those components may be releasing harmful substances, students identify negative factors that may be affecting the air they breathe.

Lesson 2: Allergies and Allies
In this lesson, students explore hostilities found within their indoor environment and cite causes of allergies. During the lesson, students compile an audit of classmates’ allergies and, with the resulting information, create a plant-based solution, using toxin eating plants as indoor allies.

Lesson 3: The Sound Around Us
In this lesson, students expand their comprehension of the indoor environment as they investigate the sense realm of hearing and sounds. Students use the constant hum of background noise in their school as a baseline for their investigation. They identify healthy and unhealthy decibel levels connected with many of their daily activities, both inside and outside of school.

Lesson 4: Seeing in the Dark
In this lesson, students investigate the body’s physiological need for light in the day and dark at night. To begin the investigation, students experiment with light extremes in the classroom environment and explore light’s relationship to student productivity. Students are able to identify study habits that may help or impede our normal circadian rhythm.

Lesson 5: Franken-building
In this lesson, students are encouraged to use newly acquired knowledge of the indoor environment in order to create the sickest building they can conceive of. Students explore counter concepts of sustainable practices by creating a building based on past unsustainable practices, complete with Volatile Organic Compounds, Co2 emissions, mold, noise and lack of proper light.
Lesson 6: Building Blocks
In this lesson, students learn about the use and impact of conventional and green building materials. They assess the benefits and drawbacks of these materials to better understand the complex choices facing today’s builders.

Lesson 7: How a Building Breathes
In the lesson, students investigate the science and necessity of moving indoor air. Students conduct a Blower Door test in their classroom and gain firsthand experience as they identify potential sources of leaks in the room. The identification process enables students to determine solutions that will lead to a healthier indoor environment.

Lesson 8: Passive Venting
In this lesson, students tackle the dynamic principles of the stack effect, convection, and geothermal temperatures. They examine how a combination of these principles can be used to create passive venting and, in some cases, cooling in the built environment. Students culminate the lesson by creating a miniature working model of a solar chimney.

Lesson 9: Green Light, Green Sound
In this lesson, students examine both ingenious and simple solutions available to indoor environments that require more light and less noise. As they learn about both types of solutions, students are able to make some immediate changes in their home environments. This lesson also imparts knowledge and tools students need to positively affect future indoor environments.

Lesson 10: School IEQ Audit – Inventory
In this lesson, students assess key locations in their school—the library, cafeteria, and gym—for sound, air and light quality. The acquired audit information, including the solutions, will be compiled and presented to the administration. Students are able to take an active role in their overall environment and its daily conditions.

Lesson 11: School IEQ Audit - Recommendations
In this lesson, students compile the results of the previous day’s audit. Once they have noted the results of all groups, they create a feasible approach toward solutions and/or upgrades, and present these solutions in a report geared toward the school administration.