

Workshop Curriculum

Air Quality and Measurements with SenseBox System

The students, aged 14-17, who could be visiting the sensebox workshop are likely to be curious, tech-savvy, and interested in learning about environmental monitoring. These young individuals may have a passion for technology and innovation, and are eager to get hands-on experience in building and programming their own sensing devices. They may be environmentally-conscious and motivated to make a positive impact on the world around them. These students are likely to be creative problem-solvers who enjoy working collaboratively with their peers to tackle real-world issues related to climate change and air quality. Overall, the students visiting the sensebox workshop are likely to be enthusiastic and driven to learn and explore the possibilities of sensor technology.

Resources:

- Presentation on atmosphere, climate and air quality
- SenseBox system (edu and components to build your own IoT-System, SenseBox board)
- Laptops, Internet access
- Flash cards (e.g. <https://sensebox.de/de/lernkarten-mcu>)

Day 1: Introduction to Air Quality

Objectives:

- Understand the basics of air quality and its importance
- Introduce the SenseBox system and its capabilities
- Learn about different air pollutants and their sources

Activities:

- Introduction to the workshop and overview of the week's activities
- Presentation on air quality and its impact on health and the environment
- Demonstration of the SenseBox system and its components
- Group discussion on different types of air pollutants and where they come from

Learning Outcomes:

- Students will have a basic understanding of air quality and its importance
- Students will be familiar with the SenseBox system and its capabilities
- Students will be able to identify different air pollutants and their sources

Day 2: Monitoring Air Quality with SenseBox

Objectives:

- Learn how to set up and calibrate the SenseBox system
- Understand how to collect and analyze air quality data
- Explore different types of sensors and their functions

Activities:

- Hands-on workshop on setting up and calibrating the SenseBox system
- Data collection exercise in different locations to observe variations in air quality
- Instruction on data analysis using the SenseBox software
- Experimentation with different sensors to measure various air pollutants

Learning Outcomes:

- Students will be able to confidently set up and calibrate the SenseBox system
- Students will know how to collect and analyze air quality data
- Students will have hands-on experience with different sensors and their functions

Day 3: Field Trip – Air Quality Measurement in the Community

Objectives:

- Apply knowledge and skills learned in the workshop in a real-world setting
- Collaborate with peers to collect and analyze air quality data
- Gain a practical understanding of air quality issues in the local community

Activities:

- Field trip to different locations in the community to measure air quality
- Data collection and analysis in groups using the SenseBox system
- Group presentation on findings and recommendations for improving air quality in the community
- Reflection and discussion on the importance of citizen science in monitoring air quality

Learning Outcomes:

- Students will apply their knowledge and skills in measuring air quality in the community
- Students will collaborate effectively with their peers to collect and analyze data
- Students will understand the importance of community involvement in monitoring air quality

Day 4: Data Interpretation and Visualization

Objectives:

- Learn how to interpret and visualize air quality data
- Understand the significance of trends and patterns in the data
- Practice communicating findings and recommendations effectively

Activities:

- Workshop on interpreting and visualizing air quality data using the SenseBox software
- Data visualization exercises to identify trends and patterns
- Group discussion on the significance of the data and its implications for air quality
- Presentation practice on communicating findings and recommendations to a wider audience

Learning Outcomes:

- Students will be able to interpret and visualize air quality data effectively
- Students will understand the significance of trends and patterns in the data
- Students will practice communicating their findings and recommendations clearly and effectively

Day 5: Wrap-Up and Reflection

Objectives:

- Reflect on the week's activities and learning outcomes
- Discuss the impact of air quality measurements on health and the environment
- Identify ways to continue monitoring and improving air quality in the community

Activities:

- Group reflection on the workshop experience and key takeaways
- Discussion on the impact of air quality measurements on health and the environment
- Action planning session to identify ways to continue monitoring and improving air quality in the community
- Closing ceremony and certificate distribution

Learning Outcomes:

- Students will reflect on their learning and experiences from the workshop
- Students will understand the importance of air quality measurements in protecting health and the environment
- Students will develop a plan for continued monitoring and improvement of air quality in the community

Conclusion

By the end of the workshop week, students will have gained a comprehensive understanding of air quality, measurement techniques using the SenseBox system, data analysis and interpretation skills, and the importance of citizen science in monitoring and improving air quality. The curriculum is designed to be engaging, hands-on, and interactive, providing students with a well-rounded educational experience.