



ASSIST-ME teaching plan

General Information

Title	Is our school's indoor environment fit for people working there?
Document version	Final
Subject and topic	Biology and Physics/Chemistry (Indoor environment/indoor climate)
Level	Lower secondary school
Short description	Measuring indoor environment/indoor climate with a possibility to improve the existing indoor environment
# Lessons	10 lessons
Learning goals	The students can perform their own tests based on hypotheses and with the knowledge of variables. They can evaluate their own investigations. The students can discuss their own and others' studies. The students can choose their own diagrams and use and compare their own and others' data.

ASSIST-ME information

Level	Denmark Lower secondary
Trial period	1
# Trials	4
ASSIST-ME feedback method(s)	Peer feedback
ASSIST-ME competencies	Empirical investigations, Argumentation
ASSIST-ME subject	Science
Types of data	Student products, ...



Learning progressions by learning goal

Empirical Investigations

Assumed knowledge: Students have knowledge of simple test methods.

Learning goal: The student can perform their own tests based on hypotheses and with the knowledge of variables. They can evaluate their own investigations.

Beginning	Intermediate	Full
The student can carry out simple surveys about the indoor environment/indoor climate at the school from the presentations and with their own written expectations formulated in dialogue with the group.	The student can design simple studies based on their own expectations and work systematically with these.	The student can perform their own tests based on hypotheses and with the knowledge of variables. They can evaluate their own investigations.

Argumentation competency

Assumed knowledge: Students can talk about their own research and read an age-appropriate scientific text.

Learning goal: The student can discuss their own and others' studies.

Beginning	Intermediate	Full
The student can use simple terms and concepts when they talk about trials.	The student can formulate simple natural science hypotheses.	The student can discuss their own and others' studies.

Content area

Assumed knowledge: Students have knowledge of the temperature scale. They know sound, light and pressure as a phenomenon. They have heard of humidity and CO₂, but do not necessarily know what it is - or how it can be measured. They can read simple diagrams.

Learning goal: The student can choose their own diagrams and use and compare their own and others' data.

Beginning	Intermediate	Full
The student knows how to measure the six factors, they know the units and can describe the difference in Sound, Light, Humidity, Temp., CO ₂ and Pressure	Understanding Sound, Light, Humidity, Temp., CO ₂ and Pressure is more nuanced and multifaceted	The student can choose their own diagrams and use and compare their own and others' data.



Schematic description of lessons

Lesson	Learning goal	Main activity	Feedback formats	Types of data
1.+2.	The student can carry out simple surveys about the indoor environment/climate at the school from the presentations and with their own written expectations formulated in dialogue with the group.	Effect of the Inklimeter (for measurement of indoor environment/climate) and exploration of data.	Open and structured dialogue	
3.+4	The student can carry out simple surveys about the indoor environment from the presentations and with their own written expectations formulated in dialogue with the group The student knows how to measure the six factors, they know the units and can describe the difference in Sound, Light, Humidity, Temp., CO2 and Pressure	The students own experiments of the indoor environment/climate at their school.	Peer-feedback	
5.+6.	The student can use simple terms and concepts when they talk about trials. Understanding Sound, Light, Humidity, Temp., CO2 and Pressure is more nuanced and multifaceted	Presentation of own data.	Peer-feedback	
7.+8.	The student can design simple studies based on their own expectations and work systematically with these. The student can formulate simple natural science hypotheses.	Based on own hypotheses experiments are designed.	Peer-feedback	
9.+10.	The student can perform	The students	Peer-	



	their own tests based on hypotheses and with the knowledge of variables . They can evaluate their own investigations.	experiments are performed and hypotheses verified.	feedback	
11.+12.	<p>The student can discuss their own and others' studies.</p> <p>The student can choose their own diagrams and use and compare their own and others' data.</p>	Project ideas presented on the basis of their own data.	Peer-feedback	



Lesson title: 1. Module		Implementation date:	
Summary plan			
Learning goal for lesson The student can carry out simple surveys about the indoor environment/climate at the school from the presentations and with their own written expectations formulated in dialogue with the group.		Subject content What abiotic factors can be measured in the indoor environment/climate. Concepts: - Sound - Light - Humidity - Temp. - CO2 - Pressure	
Process goals <i>Being curious</i>		Resources Inklimeter PCs and similar	
Activity plan			
Tme	Activity	Teacher role	Student role
2 x 45 minutes	<p>a) All students are active in the room , so that the Inklimeter is affected.</p> <p>b) The Inklimeter is reviewed, and the ability to access over the network is presented. Have we made changes to the measurements with our activities? Ex. on the SmartBoard (visualized ex. about indoor environment/climate) : - Noise, temp. , light (glass fronts) , humidity , CO2.</p> <p>c) Gaining that there exist factors that affect indoor environment/climate (ex. such as air quality). Next time we can measure some of the factors ourselves.</p>	<p>Dialogue</p> <p>Monologue</p> <p>Monologue/ Dialogue</p>	<p>Active</p> <p>Active participating</p>
Description of key activities: Effect of the Inklimeter (for measurement of indoor environment/climate) and exploration of data.			
Assessment plan – description of format and implementation Will be observed when students begin the studies we put them through using small compendiums on respectively Sound, Light, Humidity, Temp., CO2 and Pressure.			
Lesson title: 2. Module		Implementation date:	



Summary plan			
Learning goal for lesson		Subject content	
<p>The student can carry out simple surveys about the indoor environment from the presentations and with their own written expectations formulated in dialogue with the group</p> <p>The student knows how to measure the six factors, they know the units and can describe the difference in Sound, Light, Humidity, Temp., CO2 and Pressure</p>		<p>What abiotic factors can be measured in the indoor environment.</p> <p>Concepts:</p> <ul style="list-style-type: none"> - Sound - Light - Humidity - Temp. - CO2 - Pressure 	
Process goals		Resources	
<p><i>Appropriate actions</i></p> <p>Communicating results</p>		<p>Compendium/a sheet (4 pcs. within each of the four areas)</p> <p>Possibly various apps for smartphones</p> <p>PCs and similar</p> <p>Other relevant lab. equipment</p>	
Activity plan			
Tme	Activity	Teacher role	Student role
2 x 45 minutes	<p>Students are divided into groups</p> <p>The groups are allocated to a subject of their own study Sound, Light, Humidity, Temp., CO2 and Pressure</p> <p>The groups are sent out on school premises. At various locations where they move, measurements take place and the data is being treated to be presented next time.</p> <p>Criteria: The submission must include both a theoretical and practical aspects on the basis of their own data .</p>	Facilitation	<p>Experimental</p> <p>Cooperating</p>
Description of key activities:			
The students' own experiments of the indoor environment/climate at their school.			
Assessment plan – description of format and implementation			
This phase will be observed when students begin the studies we put them through using small compendiums on respectively Sound, Light, Humidity, Temp., CO2 and Pressure.			
Will be observed when students complete its work on the tests we put them through using small compendiums/a sheet on respectively Sound, Light, Humidity, Temp., CO2 and Pressure.			



Lesson title: 3. Module		Implementation date:	
Summary plan			
Learning goal for lesson The student can use simple terms and concepts when they talk about trials. Understanding Sound, Light, Humidity, Temp., CO2 and Pressure is more nuanced and multifaceted		Subject content What abiotic factors can be measured in the indoor environment. Concepts: - Sound - Light - Humidity - Temp. - CO2 - Pressure	
Process goals <i>Being curious</i> Communicating results		Resources	
Activity plan			
Tme	Activity	Teacher role	Student role
2 x 45 minutes	The groups present their data (practical and theoretical)	Active questioning	Presenter Active questioning
Description of key activities: Presentation and communication of own data.			
Assessment plan – description of format and implementation Will be observed when students begin/presents/give each other feedback on the studies we put them through using small compendiums/a sheet on respectively Sound, Light, Humidity, Temp., CO2 and Pressure. Increased professionalism behind their understanding of the concepts revealed when students establish working hypotheses and explains what they will look for on indoor environment/climate at school and why.			



Lesson title: 4. Module		Implementation date:	
Summary plan			
Learning goal for lesson The student can design simple studies based on their own expectations and work systematically with these. The student can formulate simple natural science hypotheses.		Subject content What abiotic factors can be measured in the indoor environment. Concepts: - Sound - Light - Humidity - Temp. - CO2 - Pressure	
Process goals <i>Appropriate actions</i> <i>Finding solutions</i> Crafting		Resources Inklimeter Possibly various apps for smartphones PCs and similar Other relevant lab. equipment	
Activity plan			
Tme	Activity	Teacher role	Student role
2 x 45 minutes	a) New groups established by an expert from each of the six areas . Each group shall prepare a hypothesis that relates to the title and is subject to verification. b) Plenum approval of the groups' hypotheses.	Facilitation Active questioning	Cooperating Experimenting Active questioning
Description of key activities: Based on own hypotheses experiments are discussed and designed.			
Assessment plan – description of format and implementation Will be observed when students establish working hypotheses and explains what they will study on indoor environment/climate at school and why. The students' use of terms and concepts can be seen when students establish working hypotheses and explains what they will look for on indoor environment/climate at school and why.			



Lesson title: 5. Module		Implementation date:	
Summary plan			
Learning goal for lesson The student can perform their own tests based on hypotheses and with the knowledge of variables. They can evaluate their own investigations.		Subject content What abiotic factors can be measured in the indoor environment. Concepts: - Sound - Light - Humidity - Temp. - CO2 - Pressure	
Process goals <i>Appropriate actions</i> <i>Finding solutions</i> Crafting			Resources
Activity plan			
Tme	Activity	Teacher role	Student role
2 x 45 minutes	Each group shall prepare a hypothesis that relates to the title and is subject to verification.	Facilitation	Cooperating Experimenting
Description of key activities: The students' experiments are performed and hypotheses verified.			
Assessment plan – description of format and implementation Will be observed when students "research" and when they present their data/findings.			



Lesson title: 6. Module		Implementation date:	
Summary plan			
Learning goal for lesson The student can discuss their own and others' studies and results. The student can choose their own diagrams and use and compare their own and others' data.		Subject content What abiotic factors can be measured in the indoor environment. Concepts: - Sound - Light - Humidity - Temp. - CO2 - Pressure	
Process goals <i>Being curious</i> <i>Finding solutions</i> Communicating results			Resources
Activity plan			
Tme	Activity	Teacher role	Student role
2 x 45 minutes	<u>a)</u> Shared decision on which project that might be passed on to the school board/student council. <u>b)</u> Presentation of the groups hypotheses using own data collected (including the ability to argue and support/explain these).	Active questioning Dialogue	Communicating actively Active questioning
Description of key activities: Project ideas presented on the basis of their own data.			
Assessment plan – description of format and implementation This phase will be observed when students "research" and when they present/give feedback on own studies as well as in the decision of which project you should proceed with. Will be observed when students "research" and when they present their own research as well as providing feedback on the other groups' presentations.			



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