



## „Solution for clean air environment” - lesson plan

Duration	1 hour
Age	6 - 9
Type of classes	didactic and educational activities
Goals	<ul style="list-style-type: none"> <li>● To develop understanding of importance of clean air environment,</li> <li>● to acquaint students with the existence of legislation on air pollution,</li> <li>● to familiarize children with basic solutions and measures for air protection and air pollution implemented on a state level,</li> <li>● to develop awareness and understanding of the daily air quality by using the Air Quality Index (AQI),</li> <li>● to familiarize how to behave in the case of air pollution,</li> <li>● to enhance soft skills: critical thinking, creative and communication skills.</li> </ul>
Methods	brainstorming, discussion, film screening, didactic games
Forms of work	Individual, in groups, collective
Needed material	<ul style="list-style-type: none"> <li>● attached material: working lists + images,</li> <li>● flipchart/blackboard,</li> <li>● chalk/marker pen,</li> <li>● coloured pencils,</li> <li>● paper plates,</li> <li>● yarn/string,</li> <li>● vaseline,</li> <li>● hole puncher (optional)</li> </ul>

Attention: During the lesson, it is worth using the dedicated presentation available to download from the "Clean Air" website.

The presentation consists of slides related to topics discussed during the lesson. The teacher after completing each exercise can use a slide (or slides) summarizing the given issue, to remind the most important information and to systematize the knowledge of students. The presentation also includes slides with exercises and the answers to them.



## 1. What can be done? - letter from Lucy

Students are aware from previous lesson plans that it is important to have clean air. We are dependent on oxygen we are breathing from air but in the meantime we also breathe pollutants. Maintaining the air quality at certain level is therefore essential. Teacher presents several examples on air protection and solutions for clean air by reading the text below - letter from Lucy (slide 2) which can be previously personalised.

*Hello dear children,*

*my name is Lucy, I am from a small village and I will explain you the ways how people try to keep the air clean. I have to tell you I was surprised maybe as you will be, when I found out that air pollution was really serious issue in rural areas as well as in cities. In cities, it is easy to understand because there are many sources of pollution (Teacher now call on kids to name examples for both cases) Guess what mainly pollutes the air in the villages? It is mainly because people use coal and wood which they burn in old furnaces. The worst impact was measured in the villages, where they heat intensively with brown coal. Sometimes, they even burn waste which is really really bad.*

*Due to the impact of air pollution on human health and nature, government or local authorities can pass strict legislation in which they can define specific rules that must be followed by everyone who is responsible for air pollution. There are special regulations for factories, cars and for individual boilers, which are introduced in various countries according to the needs.*

*Cars have emission limits. They are determined by the EURO standard. In factories, usually the amount of pollutants is measured by placing gauges on chimneys.*

*When it comes to the boilers used at homes nowadays the municipal police can simply check if someone is burning illegal fuels. In many places different restrictions are introduced for boilers, stoves and fireplaces: for example, the ban on burning poor quality coal and humid wood and the use of old and high-emission stoves.*

*In some cities, the local government introduces a complete ban on burning solid fuels!*

*Everybody who pollutes the air needs to stick to the levels set for him by the government. If s/he is not respecting the law, s/he might pay a fine or even go to the prison if he is polluting too much. Every factory owner has to pay a year fee for pollution. This fee goes to state and district in which factory or power station is placed. Part of this money is used for environment protection. (teacher asks) Do you know about any way how air can be protected? Do you know any solutions how air pollution can be minimized?*

*Well, government has many options how to keep the air environment clean. One of the solutions is subsidizing public transportation, putting bans on the presence of automobiles in the city center or creation of cycling routes in the city. In this way, people will be motivated not to use cars so often but walk, cycle or use public transportation instead. Nevertheless, the main solution is to stop using fossil fuels and switch to alternative energy sources. Authorities can support the poorest citizens in the process of heating system replacement and thermal renovation of houses.*

*So, these were the solutions for air protection. Now, I think you know everything you need about this topic, isn't it cool? Good luck with your studies!*

*Lucy*

Instructions for the teacher: s/he will tell students:

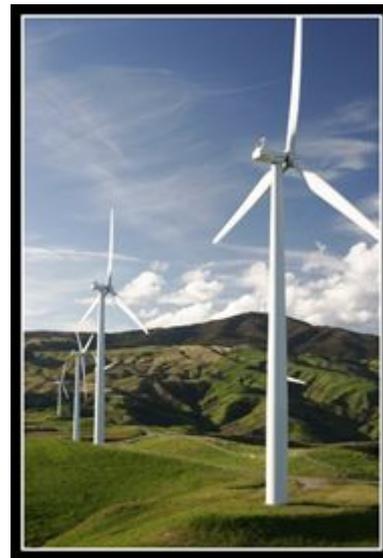
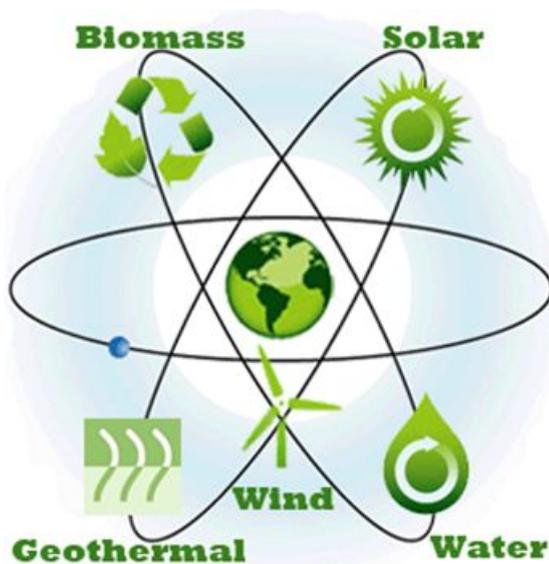


Just as Lucy said, it is good to use renewables to heat our house. The teacher shows various pictures to the children with energy sources and asks them to guess what it is. Later, s/he asks what their parents use at home to heat. Do some of them use heat pumps (slide 3)?

In case s/he is using power point presentation: shows slides in the presentation of various alternative energy sources, describe the definition and explain examples given in the pictures.

In case the teacher is not using power point presentation, s/he prints the pictures out and explain the term alternative energy sources and provide the examples (slide 4).

## Alternative Energy Sources





## 2. Puzzle

The teacher places in a prominent place, for example on a blackboard, a board with drawings (along with the captions) appearing in the puzzle and explains the meaning of individual drawings. Then she/he gives the children a page with a puzzle and/or displays it on the presentation (slides 5-10)

### **Variant A – Role division**

The teacher randomly selects children from the class and assigns them individual roles in accordance with the pictures from the board. The teacher (or other child) plays the role of a reader and reads the text written in words. Students join the text they read by saying the name of the previously indicated picture. In this way, they read the text related to the subject of air pollution together.

### **Variant B – Common reading of the text**

The teacher introduces students to the way the encrypted text is read. The teacher acts as a narrator, and the whole class, on the teacher's signal, tries to read the content of the encrypted message together. The teacher indicates on the board a given symbol when it appears in the content.

NOTE: For younger children (not able to read), you can reduce the number of symbols and choose the ones that are unambiguous (eg car, house, heart)

### **Variant C – Division into parts**

The teacher divides the text into 4 sections and entrusts 4 students with reading the encrypted message. Each of them reads the fragment indicated by the teacher.

Then the pictures can be colored.

## 3. How do we know whether the air is clean? - Air Quality Index

How do we know whether the air is clean? (slide 11) The teacher reminds the topic of air quality index. She/he says that this is one of the ways how authorities can inform residents about current air quality in an easy and accessible way.

Teacher can also shortly remind the smog situation = short term extraordinary huge amount of air pollution which is created when smoke and fog mix. Even the short time spend in this situation is dangerous for people and nature. When smog occurs, government needs to alert people living in the affected area. It is recommended not to go outside if not necessary, the traffic transportation can be limited as well.

He/she explains that AQI uses colours (green=good, yellow=moderate, orange=unhealthy for sensitive groups, red=unhealthy, purple=very unhealthy and maroon=hazardous) and numbers (from 0 to 500) to distinguish between healthy and unhealthy days. (slide 12-13) What is the best time to play outside? What colour(s) represents it? On contrary, is there any time when it might be dangerous for your health to stay outdoors? Which colour(s) would represent this situation?

They will get the answers by the play.

Play: The teacher demonstrates pieces of paper in 3 colors: green, yellow and red.



### Variant A – when there is not enough room in the room

The teacher tells the children that from now on they are flowers that like sunshine and a clean environment, and are afraid of polluted, harmful air, which is being chased by the wind.

Therefore:

- when the teacher shows green - the children show the "sunshine" with their hands above their heads
- when the teacher shows red - children hide under their arms
- when the teacher shows yellow - the children sit without moving

The exercise can be repeated several times. The teacher emphasizes that we too should be very careful when the air is polluted (like little flowers) and avoid physical activity outside.

### Variant B – running around the room

The teacher tells the children that from now on they are bees that like the sun and clean environment, and are afraid of polluted, harmful air, which is being chased by the wind.

Therefore:

- when the teacher shows green - the children run very fast around the room
- when the teacher shows red - children sit on the floor and hide under their arms
- when the teacher shows the yellow - the children walk slowly

The exercise can be repeated several times. The teacher emphasizes that we too should be very careful when the air is polluted (bees from fun) and avoid physical activity outside.

**ATTENTION: It is also worth consider using music for the exercise - cheerful during sun, sad during smog and wind noise (slide 13)**

AQI	Air Pollution Level	Health Implications	Cautionary Statement (for PM2.5)
0 - 50	Good	Air quality is considered satisfactory, and air pollution poses little or no risk	None
51 -100	Moderate	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
101-150	Unhealthy for Sensitive Groups	Members of sensitive groups may experience health effects. The general public is not likely to be affected.	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
151-200	Unhealthy	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion
201-300	Very Unhealthy	Health warnings of emergency conditions. The entire population is more likely to be affected.	Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.
300+	Hazardous	Health alert: everyone may experience more serious health effects	Everyone should avoid all outdoor exertion

## 4. Additional activity - Air pollution chart (slide 14 and 15)

Pupils can create their own air pollution chart. Each kid is supposed to draw and colour emoticons in the chart provided below. They will in this way track actual air quality and see proper behavior in this time.

The exercise is inspired by this air chart (in Polish):

[https://scontent.fktw2-1.fna.fbcdn.net/v/t1.0-9/55563338\\_2278705972370443\\_6745461758611161088\\_n.jpg?\\_nc\\_cat=105&\\_nc\\_ht=scontent.fktw2-1.fna&oh=8bb9203e3f01dba87005f5e0790afc3c&oe=5D0707F8](https://scontent.fktw2-1.fna.fbcdn.net/v/t1.0-9/55563338_2278705972370443_6745461758611161088_n.jpg?_nc_cat=105&_nc_ht=scontent.fktw2-1.fna&oh=8bb9203e3f01dba87005f5e0790afc3c&oe=5D0707F8)

We recommend having a look on it with kids so they can see how it is possible to draw and colour the emoticons in their charts.

<div style="border: 1px solid black; padding: 10px; margin-bottom: 20px;"> <p>What is the air quality today?</p> </div> <div style="border: 1px solid black; width: 100%; height: 150px; margin: 0 auto;"></div>		<p><b>GREAT</b> Perfect time to be outside, enjoy yourself</p>
		<p><b>GOOD</b> You can be outside without any problem.</p>
		<p><b>NEUTRAL</b> People with respiratory problem should not be outside too long.</p>
		<p><b>BAD</b> Stay outside for limited time, abstain from sport activity.</p>
		<p><b>VERY BAD</b> Go outside only if necessary.</p>
		<p><b>DRAMATIC</b> Everyone should avoid outdoor activity.</p>



## 5. Additional activity - Pollution Experiment (slide 15)

Students now know how they check the air quality online but there is a way how to examine air pollution in practice! With the help of a teacher, students will create a pollution catcher (instructions can be find below) to examine air pollution in their surroundings. There are number of varieties to this exercise. They can create it in smaller groups or individually. Teacher can work with pollution catcher in following days. Students can hang up the catchers in different locations in schools (e.g. classroom, out of the window, dining hall, garden, etc.). Next, they might predict the type of pollution caught, which location, and thus, catcher is most polluted and on contrary, which one is least polluted. The results will be analyzed and compared after some time, for example one week or a month. Also, they may examine pollution under microscope in biology class. Alternatively, students might bring their catchers home and map pollution in their households. Pollution catchers can be decorated according to kids creativity in order to make it more funny for them and also to train motoric skills.

This video: <https://www.youtube.com/watch?v=9uVdi-3AqRE> was used for inspiration to this exercise. Teacher might screen it to kids prior to the activity.

Instructions for creating a pollution catcher:

Material needed: paper plate, yarn, hole punch/pencil, vaseline

1. Make two holes in the paper plate by using hole punch or pencil.
2. Put yarn or string through the hole and make a knot.
3. On one side of the plate draw a picture, for example something connected to nature like animals or plants.
4. Take a lit a bit of vaseline and smear it on the other side of the plate. This is side where the air will be caught.

Pollution catcher is done. Decide where you want to catch your pollution and hang it there. After some time, take off your plate and check the level of pollution caught.

## 6. Additional activity - Plants in the classroom

If it is possible, it is recommended to take kids outside and plant some trees or plants with them in the area of a school estate. In this way, they will see a practical solution for improving the air quality. Another possibility is to encourage them to bring some plants to school. There are specific plants that can help to filter the pollution, and thus, to clean the air in an indoor environment, e.g. Peace lily, Dragon tree, Golden photos, Chinese evergreen, ficus and so on. This activity develops also children's' responsibility since they will need to look after the plants afterwards.

The teacher completes the lesson by showing slide 16.



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