Hygiene measures and the significance of moisture

**Duration**
2–3 hours

**Time of year**
Any

**Place**
Classroom

**Materials**
Paper, a bag of flour, 2 slices of bread, 2 small plastic bags

**Aims**
● To highlight the importance of washing hands
● To learn how moisture is essential to the growth of mould

**Methods**
Games, discussion, brainstorming

**GAME**

**Dirty hands spread dirt everywhere**

- Explain to the students that small hygiene measures such as not sneezing or coughing in front of people will help to prevent the spread of germs in the air. Germs are transmitted in invisible droplets that can travel over long distances. They adhere to dust or other surfaces and cling to the skin when those surfaces are touched. Germs can be transmitted even if the droplets have dried up and may be combined in dust with allergens and chemicals. Washing your hands properly with mild soap (you don't need powerful disinfectants that may be harmful to your skin!) and water for at least 20 to 30 seconds is one of the most important measures to protect you from all these particles and to stop the spread of germs to others in the classroom.

- Start the lesson by asking students how many times they wash their hands in a day, and when.
  - Explain that hands are the most common vehicle for transferring dirt — and indoor air pollutants that are attached to the dirt — to other places, other people, and other parts of the body (e.g. by rubbing your eyes).

- Explain to your students that you are going to do an experiment that shows how dirty hands spread dirt.

**Materials needed:**

- White or coloured paper
- Flour

  ▶ First of all, make sure that none of the children participating in the game are allergic to flour or have damaged skin on their hands.
Select two small groups of children:

- Group A is the “flour” group
- Group B is the “no-flour” group

Invite the members of Group A to cover their hands with flour.
(Coloured spices may also be used.)

Invite the members of the two groups to shake hands with each other.

Invite both groups to touch various things around them, such as the door handle or their desk.

Invite the remaining members of the class to shake hands with both groups and to use the door handle and desks.

At the end of the game, count how many hands and objects show traces of flour.

**Discussion**
- Discuss the results with the students.
- Explain the importance of washing hands properly.

**EXPERIMENT**

**Why is moisture important for mould growth?**

This simple experiment will help children understand how damp conditions and insufficient ventilation can lead to the growth of mould.

**Materials needed:**
- 2 slices of bread
- A little water
- 2 plastic bags with labels and zippers

Label the plastic bags “Dry” and “Moist”.

Write the date on the bags.

Put a slice of bread in the plastic bag marked “Dry” without letting it get wet.

Sprinkle the second slice of bread with water and place it in the plastic bag labelled “Moist”.

Seal both plastic bags and store them for 10 days in a warm place, making sure that no one touches them.

Record the growth of mould each day.

Throw away the sealed bags when the experiment is over!

**Discussion**
- Discuss with the students what was different about the dry and moist plastic bags and explain how moisture is important for the growth of mould.
Learning to read labels

**Duration**
2–3 hours

**Time of year**
Any

**Place**
Classroom

**Materials**
Pictures of labels

**Aims**
- To make children aware of chemical hazards in schools
- To teach children how to read labels and choose eco-friendly and healthier products

**Methods**
Discussion, association game

**DISCUSSION**
**Be clear about chemicals**
- Talk to the children about the chemicals found in their school and about the importance of reading labels to find out about the health risks associated with improper use.

**ASSOCIATION GAME 1**
**Safety labels**
- Distribute pictures or display chemical safety labels (some examples are given below). Explain why they are used and suggest an association game between the symbols and their meaning.

- Explosive (E) substances
- Oxidant (O) substances
- Corrosive (C) substances
- (N) Substances dangerous to the environment
- Toxic (T) substances and Highly toxic (T+) substances
- Inflammable (F) substances and Highly inflammable (F+) substances
- Irritative (Xi) substances and Harmful (Xn) substances

- You can also show the children the labels on empty cleaning product containers and discuss what they mean.
ASSOCIATION GAME 2

Ecological labels (national and EU)

- Explain what ecological labels are and how, besides information on environmental protection, some of them provide information on emissions from the finished product that may be harmful to humans and animals.

- Show the children examples of ecological labels from different European countries and play a game to find associations between the symbols and the countries.

- Finland
  M1
  all types of construction products

- Denmark
  ICL
  all types of products relevant to indoor air

- Germany
  Natureplus
  linoleum + carpets; various types of construction products

- Germany
  Blue Angel
  floor coverings; various types of products for indoor use

- Austria
  Austrian Ecolabel
  resilient floor coverings; various types of construction products

- Germany
  GUT
  textile floor coverings

- Finland, Norway, Sweden
  Nordic Ecolabel
  several types of products for indoor use

- Germany
  EMICODE EC1
  adhesives; products for installation of floor coverings

- Show the children the EU Ecolabel symbol and explain that there are more than 37,000 products on the market that display the Ecolabel (even services such as tourist accommodation and campsites).
Show the children the picture below of products included in the Ecolabel system, or draw the products on the board. Discuss which are relevant for healthy indoor air and which might be responsible for emissions of chemicals (all-purpose cleaners, paints, wood furniture, floor coverings, personal computers, lubricants).

Further information on the EU Ecolabel, and the Ecolabel Catalogue, can be found on the [European Commission](https://ec.europa.eu/environment/labels/) website.
Different hazards from different kinds of smoke

<table>
<thead>
<tr>
<th>Duration</th>
<th>1 hour</th>
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<tbody>
<tr>
<td>Time of year</td>
<td>Any</td>
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<tr>
<td>Place</td>
<td>Classroom</td>
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<tr>
<td>Materials</td>
<td>Paper</td>
</tr>
</tbody>
</table>
| Aims | ● To explain the different types of smoke  
      ● To explain the health effects of smoking  
      ● To raise awareness of the harmful effects of smoking on your own health and the health of people around you |
| Methods | Association game, discussion, brainstorming |

ASSOCIATION GAME

Sources of smoke

- Draw three balloons on the blackboard and ask the children how many kinds of smoke they are aware of. Discuss their responses.

- **Primary smoke**
  - Explain to the children how smoking cigarettes can seriously damage the airways.

  The lungs are lined with tiny hairs called cilia. The wave-like motion of these hairs sweeps dust, pollen and other irritants out of the lungs. However, cigarette smoke damages these tiny hairs. This means the smoker’s lungs are less able to clean themselves, which can lead to the accumulation of mucus and toxic substances, thus increasing the risk of lung infections and disease and, in youngsters, affecting lung development. Smoking can also damage the small airways and air sacs within the lungs, resulting in other respiratory diseases in the long term (e.g. emphysema) that reduce the ability to breath.

  - Ask the children how you can tell if someone has just finished smoking a cigarette (examples include bad breath and smelly clothes).

  - Ask the children how you can tell if a person smokes a lot or has been smoking for many years (stained yellow or brownish teeth; yellow nicotine stains on the fingers; and a persistent cough and hoarse voice).
Different hazards from different kinds of smoke

LESSON PLAN

Draw a person on the blackboard and circle the main organs affected by cigarette smoking (lung, heart etc.).

Second-hand smoke
- Explain that second-hand smoke can affect the health of other people (and pets too).
  - If a person is smoking near you, you may end up:
    - coughing;
    - sneezing;
    - having itchy eyes; or
    - having difficulties in breathing normally.

Third-hand smoke
- Young children are not able to choose to leave a smoke-filled room or to live in a smoke-free environment, but some simple examples may help them to recognise the risks.
  - Ask the children if they have ever noticed anything happening to them when they walk into a room where people habitually smoke (e.g. coughing, sneezing, having itchy eyes).
  - Ask if they can still smell smoke in a room that smokers have recently left.
  - Ask if they can recognise the smell of smoke on pillows, curtains or other textiles in an environment that is not smoke free.

DISCUSSION
Say no to cigarettes!
- Ask the children to think about how smoking might affect their lives. Base the discussion around the following effects of smoking at a young age:
  - reduced levels of fitness;
  - bad breath;
  - being unattractive to non-smoking peers;
  - wasting money that could be spent on clothes, music or other things; and
  - addiction to nicotine.

Many young people develop symptoms of addiction even if they do not smoke every day. In some cases, symptoms develop within days or weeks of starting to smoke.

Further information can be obtained from two World Health Organization publications:
DISCUSSION
Making the school environment green and healthy

Begin the discussion by explaining how numerous studies have demonstrated that schools tend to be places where children are exposed to toxic chemicals, moulds, lead, asbestos and other harmful substances. Some schools are located in areas where the outdoor air is so polluted that teachers are reluctant to open the windows. As children spend about one-third of their day at school, experts have recognised that healthy school facilities could, if given the appropriate support, provide children with the most pollution free part of their day.

Ask the children to suggest what is important in order to create a healthy school environment. Guide the discussion to focus on energy and water conservation, recycling, environmentally sound purchasing, non-toxic cleaning products, integrated pest management, a school garden to provide healthy additions to the cafeteria food, and a sustainably developed site.

GROUP WORK
Designing a green and healthy school environment

Divide the class into groups of around six and ask them to create a design for their ideal school. Ask them to think about the location and orientation of the building, the building materials and products used, the facilities in the school yard, and the school surroundings.

The groups should each present a drawing of their design to the rest of the class. The children can then discuss where their ideas are similar, and where the designs differ. Are there any features that are common to all the designs? What do the children consider most important? What are the good features in their own school?
GROUP WORK
Finding out about green and healthy products

Ask the children to discuss the following statements in groups of about six (15 minutes):

- I can find out more about products from the Internet.
- I can check the labels on products to find out more about them.
- Green and healthy products are always more expensive.
- I can ask my teacher or my parents about green and healthy products.

After 15 minutes, ask the groups to present their views to the rest of the class.
Can they think of examples of green products in the classroom? Do they use green products at home?
Are they aware of green products in the shops? How would they recognise them?
What difference do they make?
Choosing cleaner, smarter ways to get around

**DISCUSSION**

Keeping fit and taking care of the environment

- Ask the children how many of them cycle regularly, and how many of them enjoy going for walks in the countryside. Does it make them feel healthier and happier? How many play a sport regularly? How would they rate their level of fitness on a scale of 1 to 10?

- Ask the children about their diet. How many of them eat fresh fruits and vegetables every day? How many of them think that what they eat can affect their health? How many of them think it’s important to care of the environment and keep their homes and schools clean?

**GROUP WORK**

Traffic around the school

- Following the general class discussion based on the questions above, the children should be divided into groups of around six.

- Ask the teams to discuss the following questions:
  - How busy are the roads around the school?
  - How many cars park near the school?
  - Do you ever find it difficult to breathe outside the school?
  - Is there a bicycle path to the school?

- The groups should discuss these questions for around 15 minutes. They should then present ideas for change to the rest of the class.

**Duration**
2–3 hours

**Time of year**
Any

**Place**
Classroom and outside the school

**Materials**
Paper, poster paper, adhesive tape, microscope or strong magnifying glass, Internet access (if possible)

**Aims**
- To highlight the importance of learning about the outdoor environment and the monitoring of transport and air quality

**Methods**
Games, discussion, brainstorming
GROUP WORK

Transport detectives

- Ask the groups to go outside the school building and to count the number of means of transport they see on the road, recording whether they are cars, buses, other vehicles, cyclists or pedestrians. The monitoring period should be 15 minutes.

- When the children return to the classroom, ask them to discuss their findings. How dense is the traffic? Why are smart mobility options important? What could be done to change the volume of cars passing the school? Ask the groups to present their ideas on a poster to share with the rest of the class.

- If a computer is available, ask the children to find out more about outdoor air pollution by visiting the websites of the monitoring stations near the school.

GROUP WORK

Analysing air samples

- Ask the group to go outside the school building to find out how much dust and particles there are in the air. Explain how they can prepare samples for testing the amount of dust in the air by cutting lengths of clear adhesive tape and pinning them onto sticks with the adhesive side outwards.

- The tape sticks should be set up at various points around the school building and should be left exposed for one or two hours, then sealed by taping over the top with clean strips of tape of the same length.

- Once back in the classroom, ask the children to look at the strips through a microscope and to count the number of dust particles they can see. The different samples from different sites (e.g. near the road, behind the building) can be compared.
Pollen and climate change

**Duration** 2–3 hours

**Time of year** Any

**Place** Classroom

**Materials** Paper, poster paper

**Aims**
- To highlight the importance of gaining knowledge about climate change, pollen and health

**Methods** Games, discussion, brainstorming

**DISCUSSION**

**Identifying allergies**

- Ask the children if they have ever felt any irritation in their eyes or nose on the way to school.
  - Is it seasonal? Is it worse on hot days?

- Ask the children how many of them have a diagnosed pollen allergy, and how many think they might have a pollen allergy. If they are unsure, suggest what they might do to find out (go to the doctor; ask their parents etc.).

**GROUP WORK**

**Does climate change affect pollen allergies?**

- Divide the class into groups of four to six children to discuss the following statements:
  - Plants exposed to carbon dioxide and ozone may produce pollen with more allergenic proteins, thus increasing the incidence of pollen allergies.
  - Plants are slowly migrating (from South to North), which means that their allergenic pollens are being introduced in other regions. As a result, more people are affected by pollen in different European regions.

- The group discussions should take around 15 minutes. After the discussion the groups should present the outcomes to the rest of the class. The class can then discuss where the group opinions coincide or differ.
GROUP WORK

How would you design a green and healthy school environment that addresses the problem of pollen allergy?

Divide the class into small groups to discuss the principles of the design. To help get them started, suggest that they focus on the following questions:

● What species of trees should be planted around the school?
● Is there a busy road nearby? Where is the school yard in relation to the road?
● How do the children get to school?
● Are there any products in or around the school that might cause allergic reactions or irritation?

The group discussions should take around 30 minutes. After the discussions, each group should present its ideas to the rest of the class in the form of a poster. A class discussion should then follow about the principles of a green and healthy school environment that addresses the problem of pollen allergies.
### LESSON PLAN

#### Lighting and noise in the classroom

<table>
<thead>
<tr>
<th>Duration</th>
<th>2–3 hours</th>
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</thead>
<tbody>
<tr>
<td>Time of year</td>
<td>Any</td>
</tr>
<tr>
<td>Place</td>
<td>Classroom</td>
</tr>
<tr>
<td>Materials</td>
<td>Paper, pencils, drum, tape recorder or mobile phone with recorded noises, poster paper</td>
</tr>
<tr>
<td>Aims</td>
<td>To highlight the role of proper lighting and low noise levels in creating good learning conditions</td>
</tr>
<tr>
<td>Methods</td>
<td>Games, discussion, brainstorming</td>
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#### DISCUSSION

**What’s going on in the classroom?**

- Ask the children whether they can all clearly see what you write on the board. Can they hear your questions without difficulty? Can they always hear what their classmates are saying? If they are unable to see and hear clearly and easily, what is the reason? Is it too bright or too dark in the room? Is there too much noise coming from outside? Is it too noisy inside the classroom?

#### GAME

**The fairy tale**

- Draw a picture on the blackboard, or display a poster that tells a story, preferably using large and small elements, and with many different colours. Lower the blinds or shades so that the classroom is in semi-darkness. Ask the children to list all the elements they can see in the picture, and to write down the story it is telling, as they perceive it. After 5 or 10 minutes, open the blinds and switch on the lights. Ask the children to identify any elements they were unable to see before.

Use the following questions as a basis for classroom discussions:

- Did the lack of light affect the number of elements the children could see in the drawing?
- Did appropriate lighting change the story, or enrich it with additional elements?
- How did the children feel working in semi-darkness and with the lights switched on?
GROUP WORK

Identifying sounds

Part 1: Take the children outside into the school yard and ask them to write down every sound they hear in a period of 15 minutes. When the children return to the classroom, divide them into small groups and ask them to compile their lists on a large sheet of paper to share with the rest of the class.

Small groups of children might also be asked to list only those sounds made by animals, human beings, machinery etc.

Part 2: Inside the classroom, show the children pictures of various objects or living things that make a noise. Play them recordings of a series of sounds (e.g. a chainsaw, traffic, a cat purring, a dog barking, an alarm clock, a rocket launch) and ask them to identify each noise.

Use the following questions as a basis for classroom discussions:

● Which sounds could damage someone’s hearing?
● Which sounds might disrupt reading and discussions in the classroom?
● Do all children agree about which sounds are pleasant or helpful? (Some might love listening to music while they do their homework, while others need silence in order to concentrate.)

EXPERIMENT

Inside the ear

Ask the children to draw an ear. They will probably draw only the outer part of the ear.

Explain how there are mechanisms inside their bodies that work together in order to enable them to hear sounds. Show them a diagram of the different parts of the ear and explain how sound travels through the ear canal to the eardrum. Gently tap a small drum and let them feel it vibrate. Explain that the same thing happens in the middle ear. The eardrum vibrates and causes the bones called the hammer, anvil and stirrup to move. The vibrations of these bones pass to the inner ear, which is called the cochlea. Very tiny hairs in the cochlea move up and down and send signals to the brain. Now bang the drum hard and let the students feel the difference in the vibration.

Use the following questions as a basis for classroom discussions:

● What happens when they hear an excessively loud or disturbing sound? Do their ears hurt? Do they get headaches?
● Do they ever have trouble hearing their friends talk? Do they sometimes find it difficult to concentrate on a classroom activity? What are the reasons?
Keeping the classroom aired

<table>
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<tr>
<th>Duration</th>
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<tbody>
<tr>
<td>Time of year</td>
<td>Any</td>
</tr>
<tr>
<td>Place</td>
<td>Classroom</td>
</tr>
<tr>
<td>Materials</td>
<td>Notebook, pens, carbon dioxide monitor</td>
</tr>
<tr>
<td>Aims</td>
<td>● To highlight the importance of ventilation and the energy efficiency of ventilation systems</td>
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<tr>
<td>Methods</td>
<td>Games, discussion, brainstorming</td>
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DISCUSSION

Windows and ventilation

- Before the activities, it is useful to have a general discussion with the children about the quality of the air in the classroom. Ask the children whether they consider it good or bad. Do any of the children suffer from regular headaches? How many times are the windows opened during the day? When are they opened?

- Discuss what good ventilation and bad ventilation mean. Ask the children to have a good look at the windows in the classroom. They can do a simple experiment to see how tightly the window fits in its frame. Ask them to open the window, lay a piece of paper on the frame, then close the window again. If they can pull the paper out with the window closed, then the windows do not fit properly. Ask them if they can see why. Are the frames rotten or warped? Ask them to check several other windows in the school building and record their findings. Once the children have learnt more about ventilation, they can design posters and put them up throughout the school in order to share the information. In addition, a team of children could volunteer to check all the windows in the school and prepare a report for the school management. If the windows fit appropriately, the report could indicate whether there is adequate ventilation to ensure good working conditions. The children could repeat the exercise at home and write a report for their parents (although parents should be consulted in advance).

- Use the following questions as a basis for discussion:
  ● Which windows in the school building are faulty?
  ● Is there any difference between south-facing windows and north-facing windows?
GROUP WORK
Window checking

Show the children the pictures below, which illustrate the amount of time needed for correct natural ventilation that allows for a complete change of air in a room.

![Ventilation scenarios]

A 1-5 minutes  
B 5-10 minutes  
C 10-15 minutes  
D 15-30 minutes  
E 30-60 minutes

Explain that the A scenario is ventilation with window and door wide open; B is ventilation with only the windows wide open; C is ventilation with windows slightly ajar; D is ventilation with windows slightly ajar and the door wide open; and E is ventilation only the windows slightly ajar.

Ask the children which ventilation scheme (A, B, C, D or E) is used in their classroom.
Are the windows and doors left open for a sufficient amount of time?

Divide the children into teams to check all the windows in each room in the school.
Suggest that they write a report for the school management on the amount of time required to ventilate each classroom in the school.
Exploring the classroom environment

Duration | 1–2 hours on several consecutive days
Time of year | Any
Place | Classroom
Materials | Paper, thermo-hygrometer, poster paper
Aims

- To highlight the importance of environmental factors such as temperature and humidity in improving comfort in the classroom

Methods | Experiment, discussion, brainstorming

DISCUSSION

Ideal indoor environment

Before the activities, a class discussion should focus on whether the children feel comfortable in their classroom. The following facts should guide the discussion:

- High indoor concentrations of CO₂ affect children's attention span and result in tiredness and a loss of concentration.
- Higher indoor CO₂ levels have been associated with the increased probability of communicable infections, asthmatic symptoms, absenteeism and impaired academic performance among children.
- Higher ventilation rates can reduce concentrations of indoor mould. There is evidence linking high microbial concentrations with general and respiratory symptoms in children.

Ask the children whether they think the temperature in the classroom makes a difference to how well they study. Are they aware of differences in the classroom environment (temperature and humidity) during different periods of the school year?

GROUP WORK

Measuring temperature and humidity

Show the children how to use a thermo-hygrometer. Divide the class into six or eight small groups and assign each group the task of measuring and recording air temperature and humidity inside the room and outside the window. In the course of one week each group should take measurements at a different time of the day, preferably between classes.
At the end of the week the collected data should be presented on a chart or graph and discussed with the class:

- Do the temperature and humidity values in the outdoor and indoor air change in the course of the day? By how much?
- What might be some of the reasons for this variation?
- Compare the indoor values with the optimal values for temperature (20°C to 24°C) and humidity (40 to 60 percent). How much do they differ?

GROUP WORK
Exploring the classroom

Divide the children into small working groups and assign different tasks such as “temperature explorers” and “humidity explorers”. The temperature explorers might, for example, identify the coolest and hottest areas in the classroom (including windows, doors and stairways). The humidity explorers might look for condensation or visible signs of humidity on the windows, walls and surfaces. This activity might be extended to the entire school building, including kitchens, cloakrooms and gym.

Discuss the findings:
- Which are the coolest, hottest and most humid spots in the classroom?
- What might explain the differences in temperature or humidity?
- Are there any visible signs of mould growth or distinctive smells?
- What simple measures can be taken to help control temperature and humidity in the classroom?

During hot summers:
- increase indoor air movement by using fans
- make sure the windows can be opened easily
- wear lighter clothes
- drink plenty of water

During cold winters:
- check temperature and humidity levels
- check if windows and doors are properly closed and thermo-isolated
- ventilate or open the windows if the room is stuffy