Green Schools Network

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ACTIVITY SHEET

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Why talk about Air borne diseases?

Did you know that over 1.6 million people died in India in 2010 because of air pollution, a vast majority having contracted tuberculosis? Hey, wait, surely we were talking about airborne diseases, not pollution! Or do diseases also feature in the smog?

First, let us find out what exactly we mean when we say airborne disease. Is it the same as infection from air pollution?

An airborne disease typically refers to any disease that is caused by pathogens – viruses, bacteria, or fungi – and transmitted through the air. The pathogens spread through aerosol particles or droplets that are expelled into the air by coughing, sneezing, raising dust, spraying liquids, you get the drift… or draft! While strict-speaking experts may not include conditions caused by air pollution under airborne diseases, the two are proven to have overlapping effects. This, as well as the choking realities of climate change, makes it imperative for us to dig a little deeper into a study and prevention of ADs.

Name.....

School Name .....

Class..... **Date** .....

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So what diseases are we talking about really?

Airborne pathogens or allergens often cause inflammation in the nose, throat, sinuses and the lungs. This results from the inhalation of these pathogens which can affect a person's respiratory system or even the rest of the body. Sinus congestion, coughing and sore throats are the usual result, with sustained exposure causing asthma. Do a few symptoms of common cold seem like no cause for alarm? What if we told you some pathogens can cause global epidemics, no less! Remember the H1N1 swine flu virus that swept across the globe in 2009?

In case you are hitting the panic button, hold on. Exposure does not always cause transmission of infection. So what does?

Firstly, how contagious the infection is. Then, the site of exposure and its duration. And last, but definitely not least, the health or level of immunity of the person who stands to catch the infection. Were you aware, for instance, that the risk of tuberculosis is higher in those suffering from HIV or diabetes? In fact, those who frequent health care centres also face a higher degree of exposure. In the case of TB patients, therefore, the recommended prevention may include isolation as well as use of special air filters and respirators as healthcare facilities for those who treat the patients.

Alright, then, an airborne epidemic may be identified and infected persons isolated to prevent it from spreading. But what about exposure to air pollution? Now here is the part where the panic button may come handy. As the world grows more urbanised, health experts are worried that respiratory diseases, including lung cancer and bronchitis, are rising unchecked in cities everywhere! For instance, does your throat get itchy when you are in traffic for a long haul? Do your eyes start to burn or do you occasionally cough? You do not need a pollution meter to gauge that the particulate matter or aerosols from burning fossil fuels – in vehicles, power plants and various industrial processes – are raising smoke alarms for an unprecedented increase in cases of respiratory diseases. Statistically speaking? The Global Burden of Disease report attributes around 627,000 deaths in 2010 in India to ambient air pollution alone, of which heart disease caused almost 50 per cent deaths, and stroke and hypertension another 25 per cent.

Hi! I am Pandit Gobar Ganesh. You will find me in Gobar Times—a magazine that tells you how your everyday life is linked to the world around you. Hooked, huh? If you want to know more about me and GobarTimes visit us at:

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ACTIVITY 1

Pollutants	2000	2005	2010
Carbon dioxide			
Ozone			
RSPM			

- Visit you r State's Pollution Control Board website. Note the status for the following:
- Now that we know what levels of pollutants pose a threat to the air you breathe why not discuss these with your colleagues at school? Also, how about sharing your observations during assembly?
- Case study of Jamshedpur:

100 suffer breathing problems following gas leak in Jamshedpur.

Jamshedpur, May 28: At least one hundred people suffered breathing problems following Chlorine gas leak from a water filter plant at the Tata Engineering and Locomotives Company (TELCO) factory in Jamshedpur.

Scores of patients were admitted to a local hospital after being exposed to poisonous gas from the factory.

Workers complained of itching in the eyes and the throat, vomiting and difficulty in breathing.

"I heard that there was gas leakage. And whosever have unintentionally inhaled the gas are facing problems such as throat is burning, itching in the eyes, and many are feeling like vomiting" said Suman Mahato, local lawmaker.

The gas leakage began from the water filter plant and later spread across the entire area.

"I am not able to breathe properly. I feel like vomiting. It feels like one will faint after inhaling this gas. Many fainted as well who have been admitted in the hospital for treatment," said Rajesh, a worker.

The surrounding areas were evacuated as a precautionary measure. Company officials said the gas leakage has been plugged.

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What are different types of airborne diseases? Airborne pathogens can carry anthrax, chicken pox, influenza, measles, meningitis, pneumonia, smallpox, tuberculosis… it is a long and lethal list. And it is not just humans who stand to suffer from airborne diseases. It can just as easily affect non-humans, such as the recent avian flu that affected poultry farms across Karnataka.

The contagion can be transferred from the infected person or animal's mouth, nose, cut, or needle puncture. Another route is via contact with contaminated air/droplets, food, or vector.

So how can you prevent contamination from such diseases? Here are some of the most universally accepted methods of prevention: washing hands, using appropriate hand disinfection, getting regular immunisations against diseases that may be locally present, wearing a surgical mask and limiting the time you spend in the presence of any patient likely to be a source of infection.

With a few exceptions, antibiotics are generally not prescribed for patients to control viral infections. They may however be prescribed to flu patients, for instance, to control or prevent secondary bacterial infections. Or in dealing with air-borne primary bacterial infections, such as pneumonic plague.

ACTIVITY 2

Fill in this table with the help of your science textbook and information that is available on the net. One has been done for you.

S.No	Disease	Symptoms	Causes	Prevention
1	Asthma	• Cough • Shortness of breath • Chest pain	Inflammation in the airways due to triggers such as pollen, dust, mold, animal hair etc.	By avoiding triggers and substances that irritate the airways. Avoid air pollution industrial dusts, and other irritating fumes as much as possible.
2	Emphysema			
3	Pneumonia			
4	Bronchitis			
5	Measles			
6	Pulmonary tuberculosis			
7	Influenza			
8	Tuberculosis			
9	Small Pox			

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Did you know that ambient or outdoor air pollution has been listed as one of the top 10 enemies to health in the world? In South Asia, including India, it is ranked as the sixth most dangerous health hazard, -- three places behind indoor air pollution, which is the second highest hazard in the region. (source: Global Burden of Disease report)

Particulate pollution particularly affects India's rural poor heavily as they do not have a choice but to burn leaves, twigs, wood or cow dung in inefficient chulhas in poorly ventilated conditions. While, as we discussed earlier, urban India is left increasingly breathless because of growing numbers of vehicles and use of dirty diesel fuel. Diesel exhausts include a large number of toxic compounds that can cause cancer and reproductive abnormalities.

But if you do not drive a diesel car, should you be worried? Yes! Why? Because half of India's urban population lives in cities where particulate pollution levels exceed the standards considered safe. And if you thought you could escape the problem by shifting to green suburbs, think again! Ground-level ozone is recognized as a key pollutant in South Asia that is not necessarily found in the most polluted parts of the city.

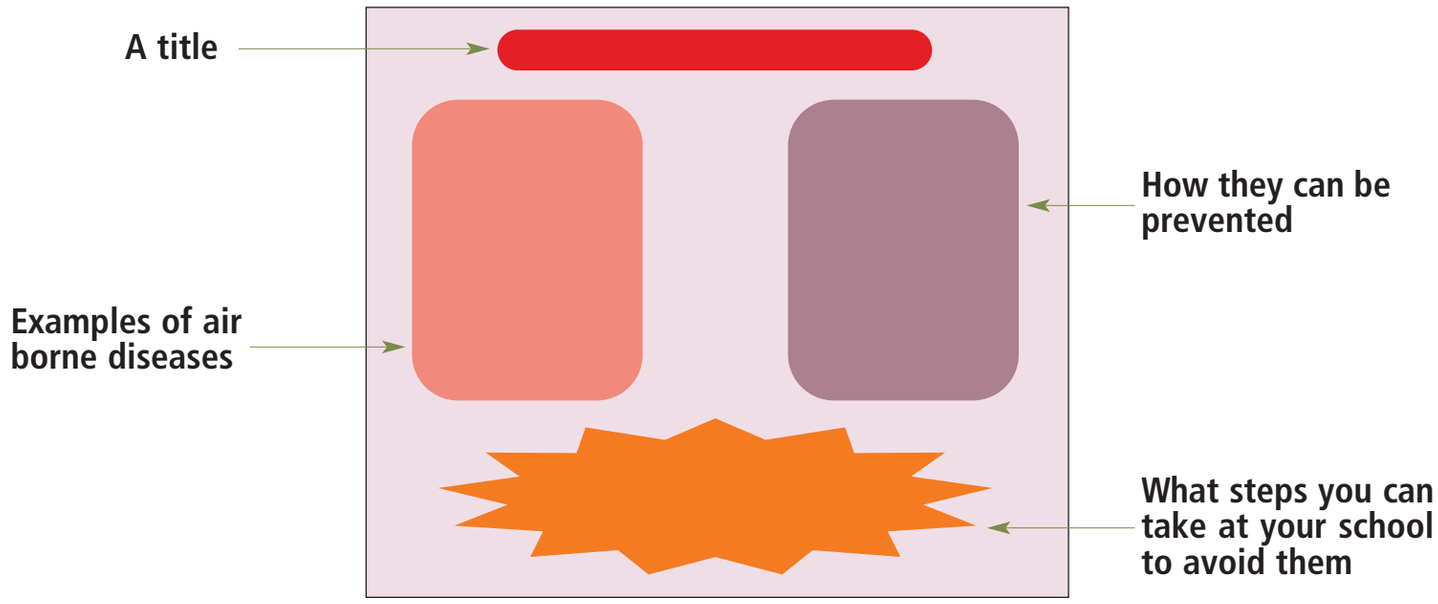
The Delhi government has implemented many measures to control air pollution. This includes the largest ever natural gas vehicle programme, relocation of polluting industries, conversion of two (out of three) power plants to natural gas, as well as improved emissions standards for vehicles, and bans on open burning. But the problem has not evaporated. Air pollution, after a short respite, is rising again and hitting dangerous levels.

Recent research published in the UK-based journal, The Guardian, also links particulate pollution with up to 10 per cent increase in the chances of women giving birth to small babies. The study, which surveyed three million births worldwide, found that higher pollution levels raised the risk of low birth-weight.

ACTIVITY 3

Create awareness!

Through this activity sheet you have learnt a lot about air borne diseases but is everyone as well informed as you? Your task is to create an A3 sized poster that sums up all that you have learnt. The poster should consist of:



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