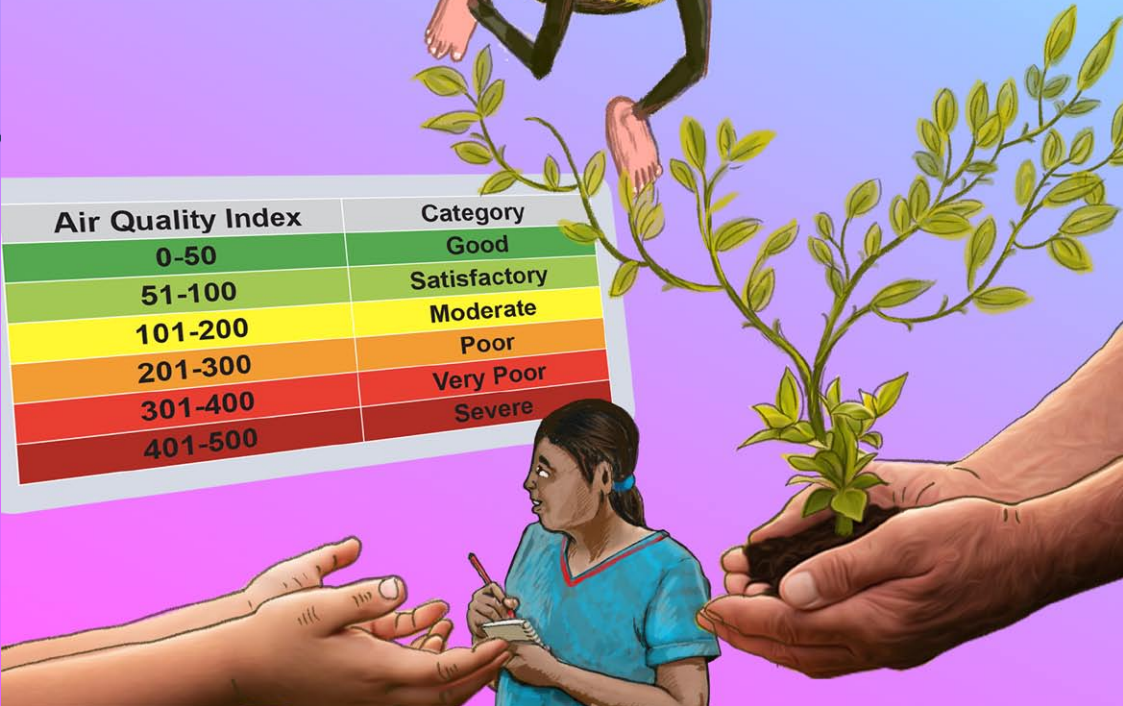


LEARNING WITH RANU & QUEENY

# CLEAN AIR BEGINS WITH ME



| Air Quality Index | Category     |
|-------------------|--------------|
| 0-50              | Good         |
| 51-100            | Satisfactory |
| 101-200           | Moderate     |
| 201-300           | Poor         |
| 301-400           | Very Poor    |
| 401-500           | Severe       |



## **Learning with Ranu & Queeny**

### **CLEAN AIR BEGINS WITH ME**

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Community Science Project – Hari Krishna

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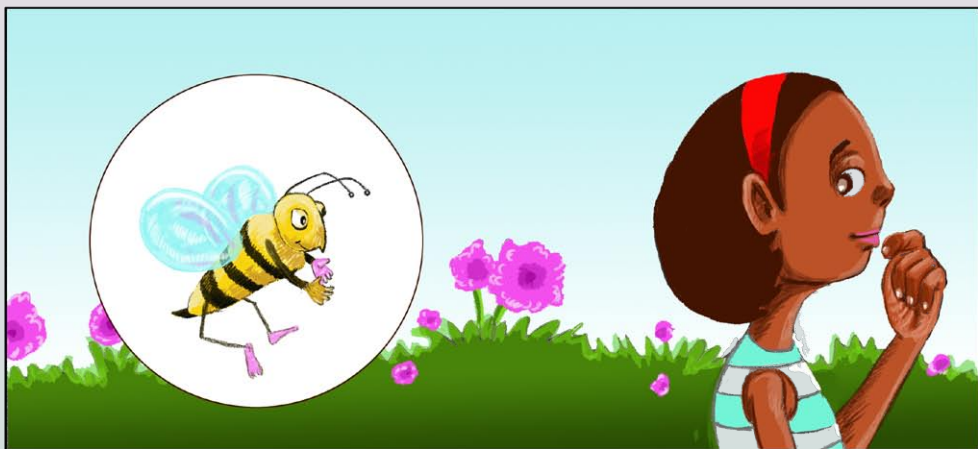
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Manager - S & CR-  
South East Asia,  
Oceania and India,  
Ericsson

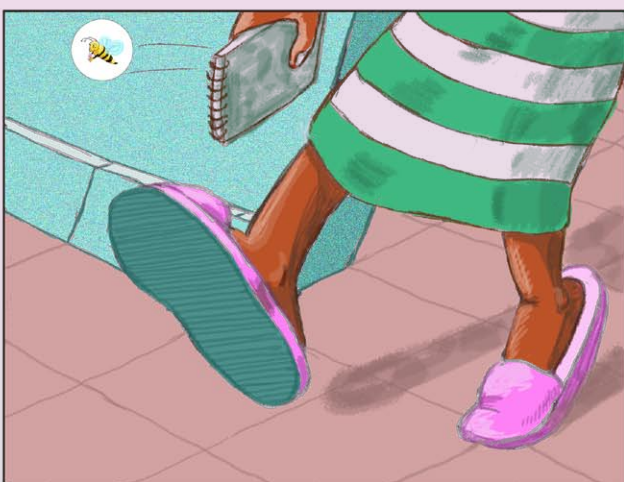
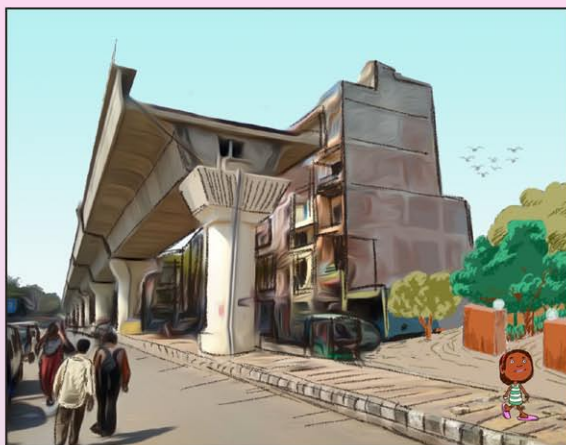


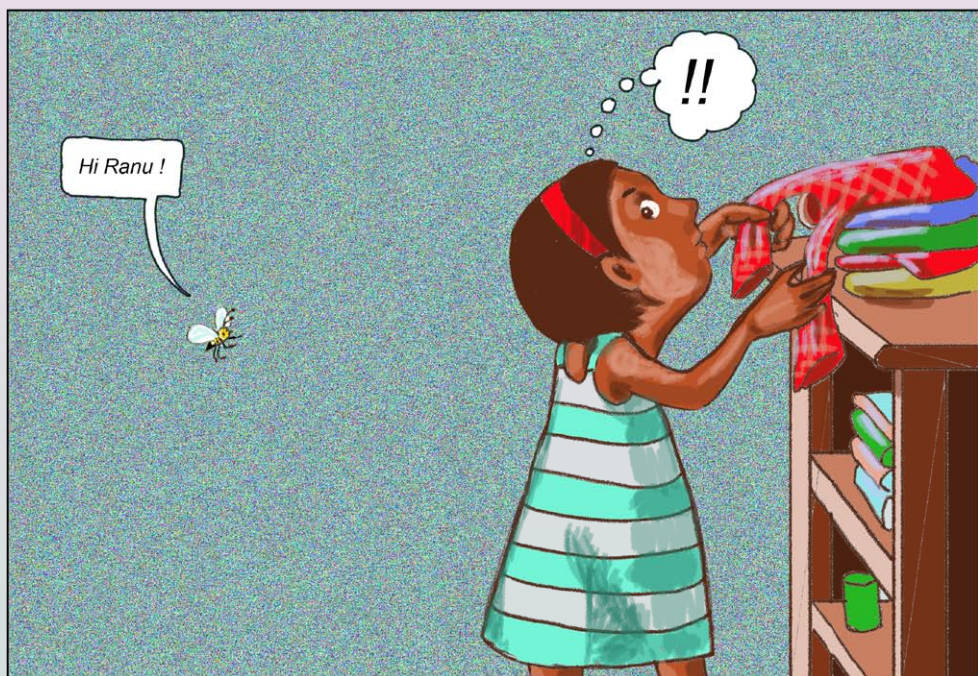
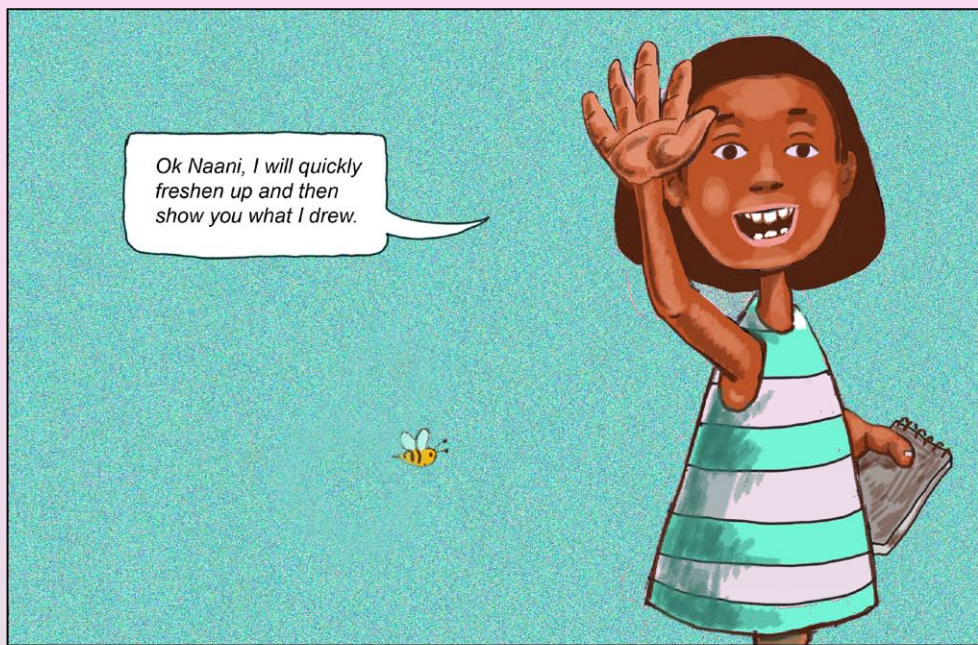
## CLEAN AIR BEGINS WITH ME

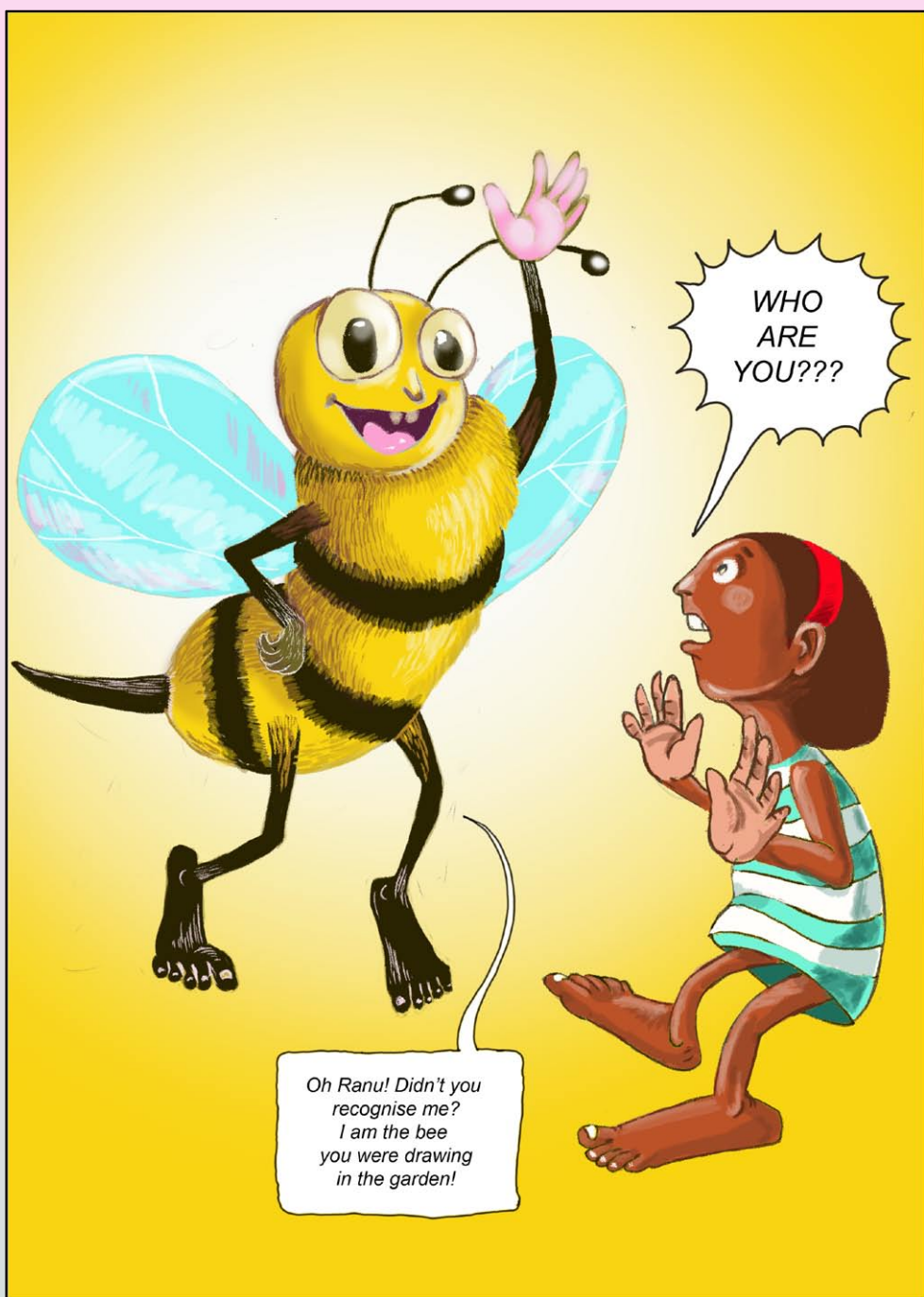


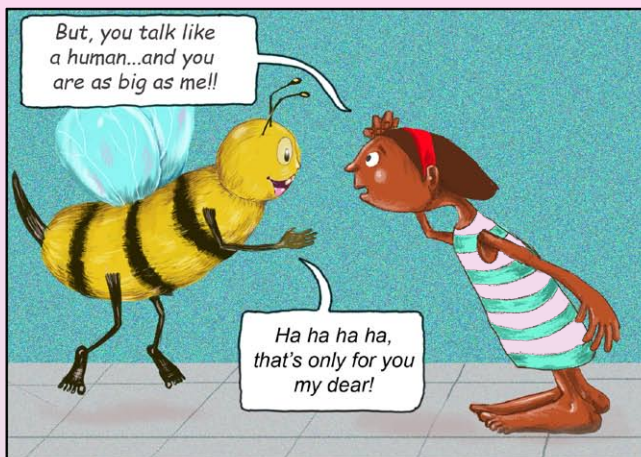




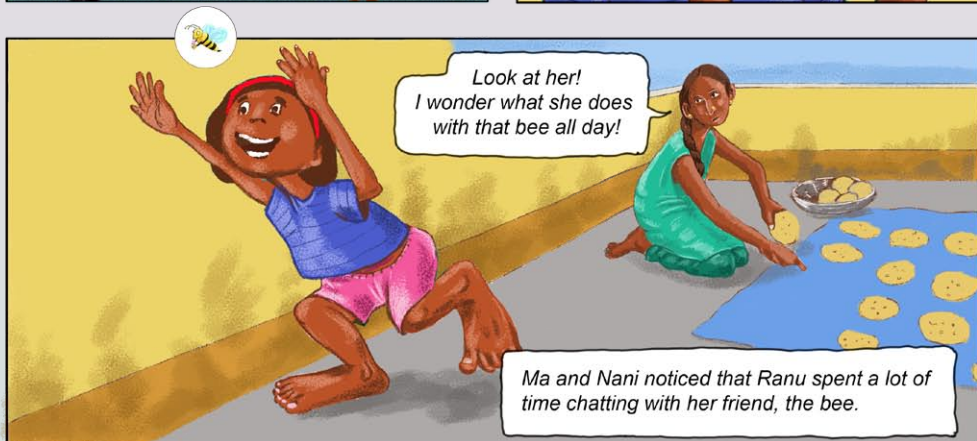


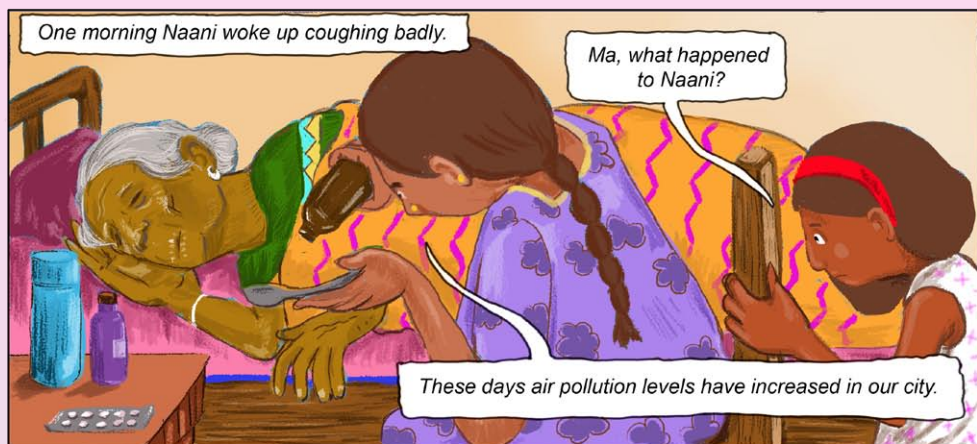


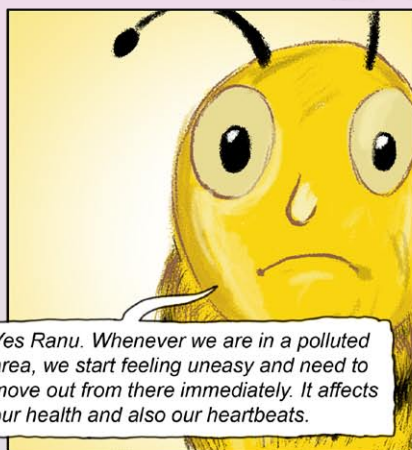
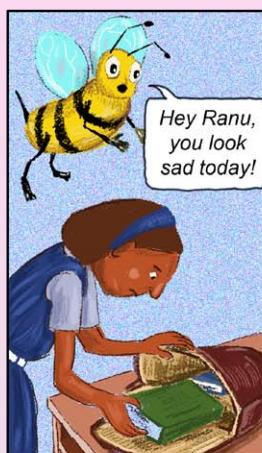


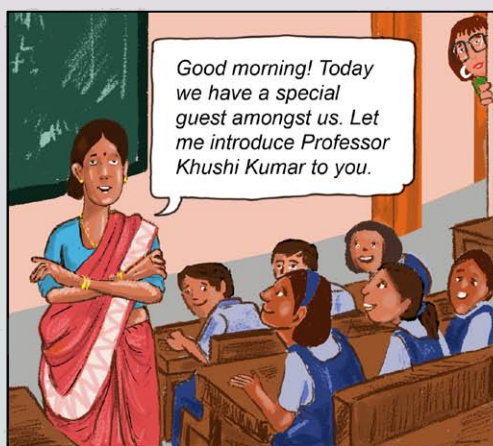


Ranu and Queeny became good friends. They were so close to each other that they soon were inseparable. In other people's presence, however Queeny always appeared as a regular sized bee.











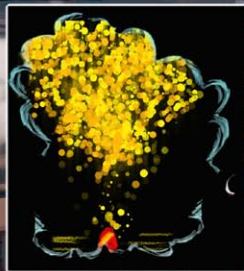


You can see them every day - emissions from moving cars, buses, trucks, and motorcycles.



It is also caused by unchecked emissions from factories and smoke from firecrackers.

We, human beings, are responsible for it.



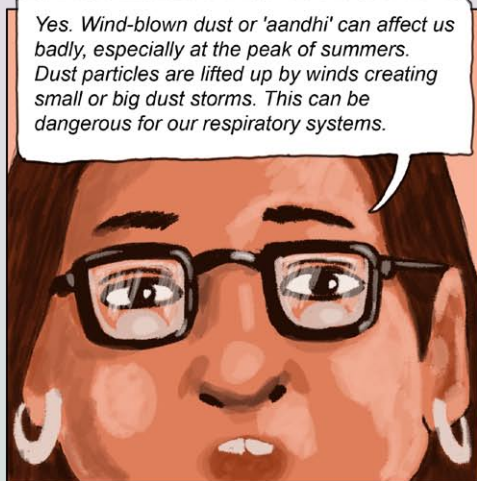
Natural sources also cause air pollution.

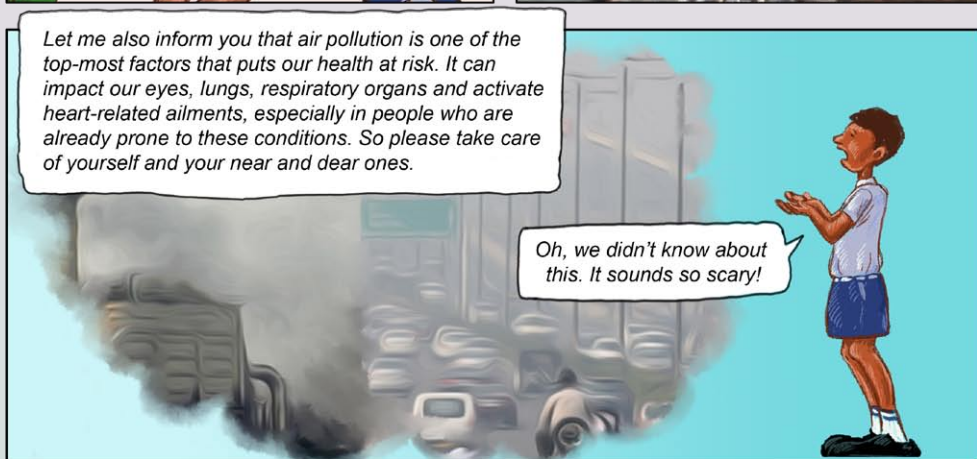
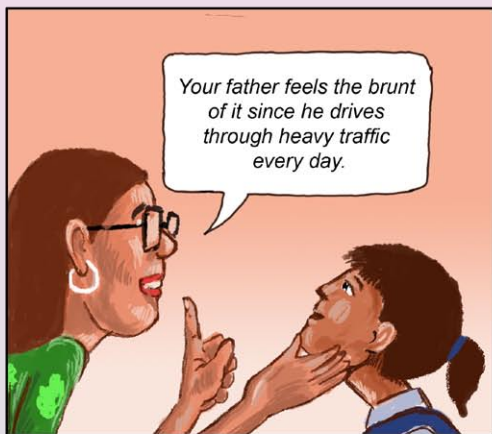
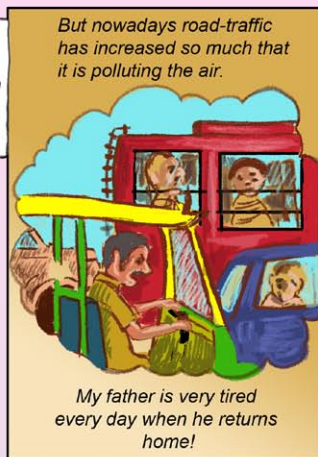
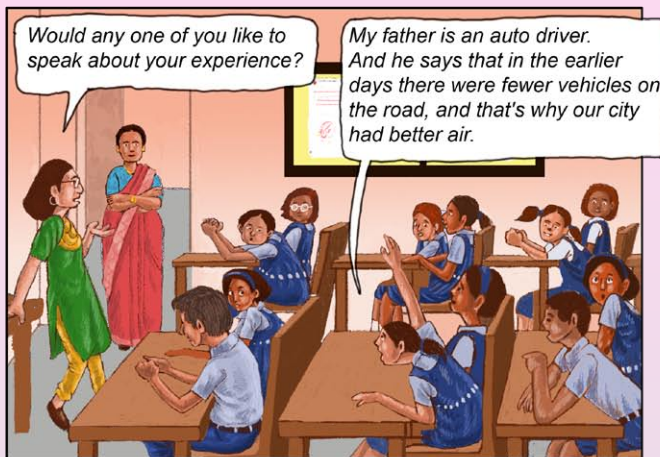


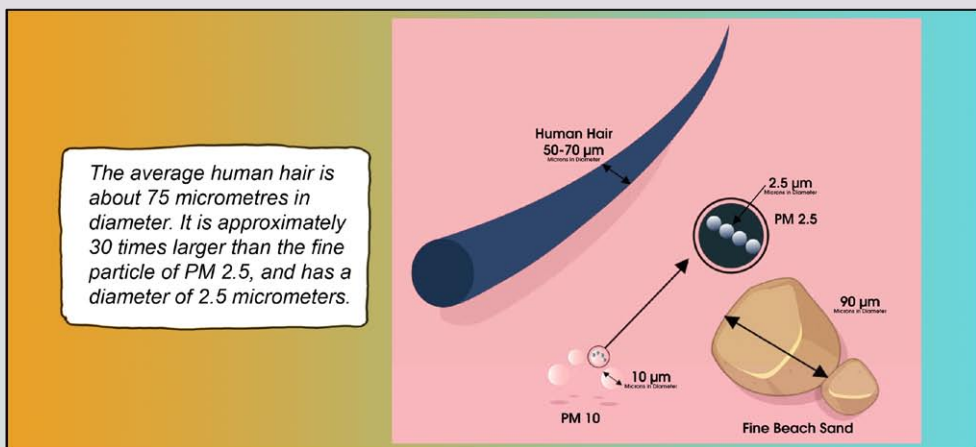
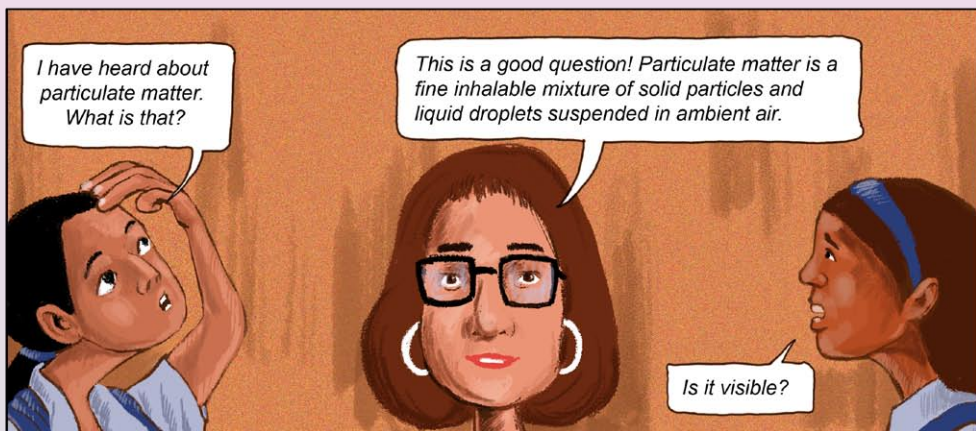
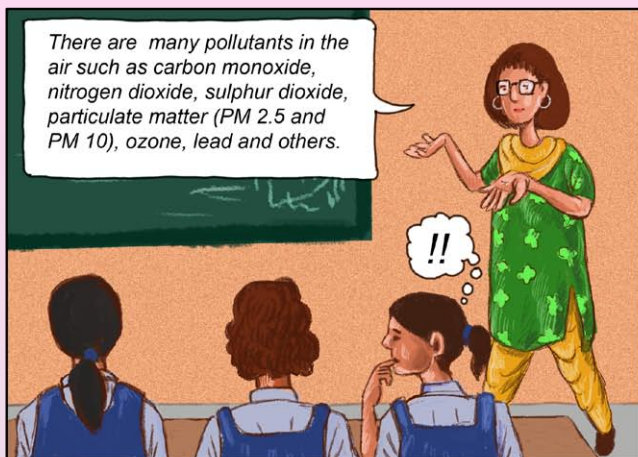
Can one of you guess what a natural source of pollution may be?

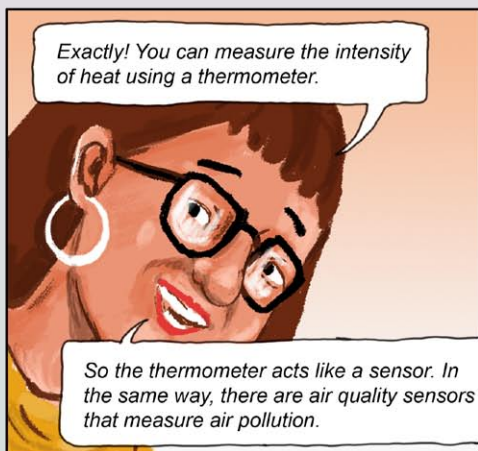
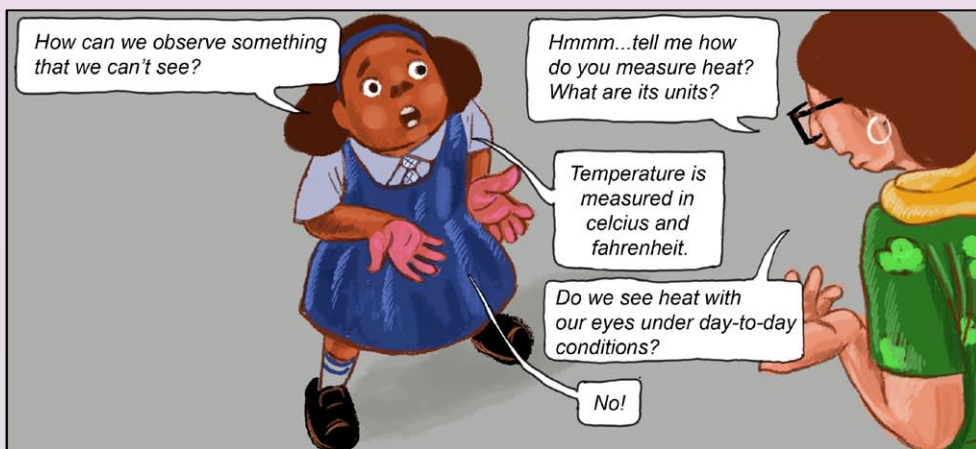
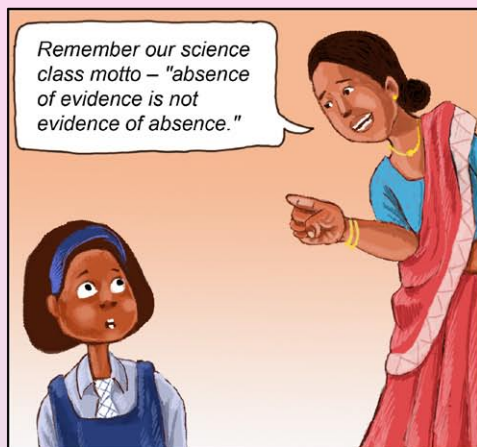
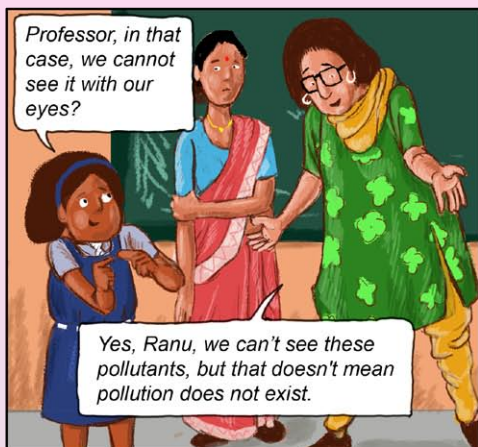
Forest fires!

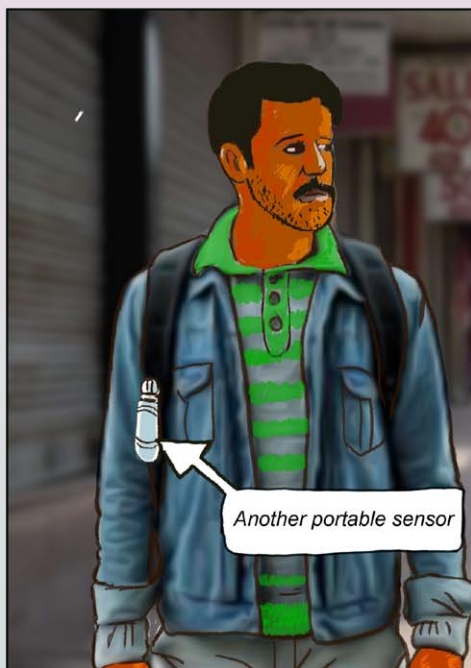
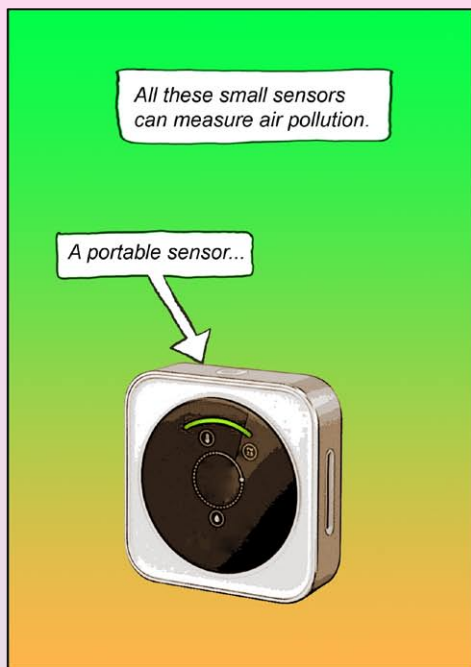
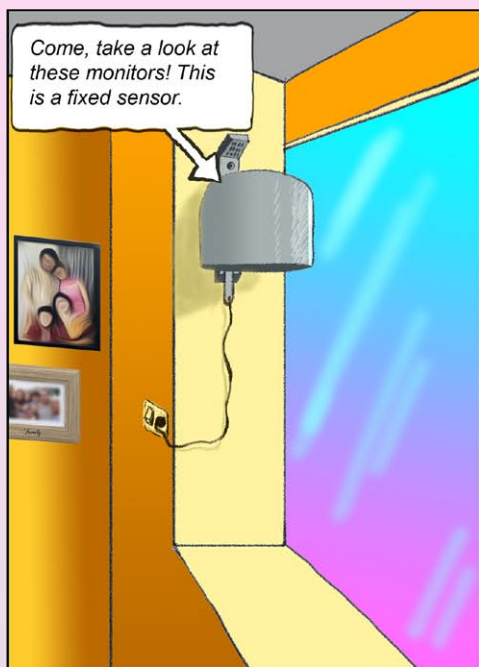


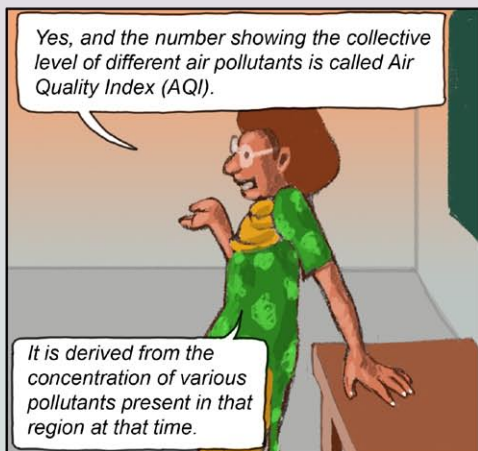
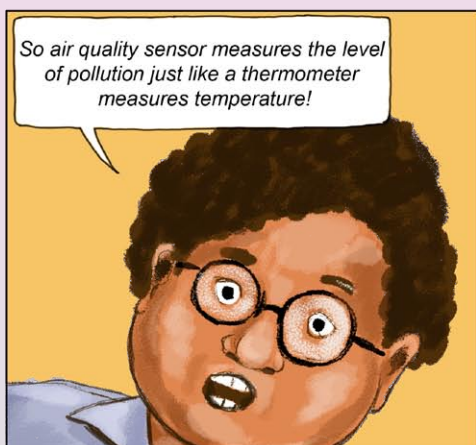
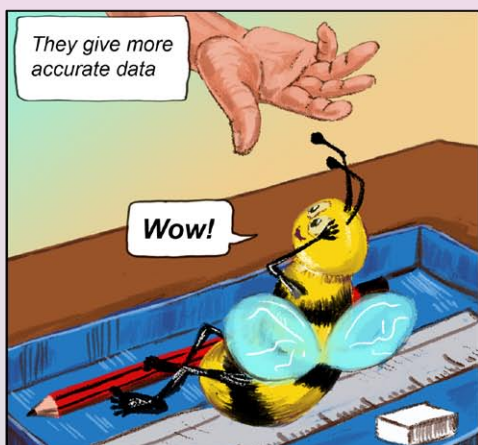
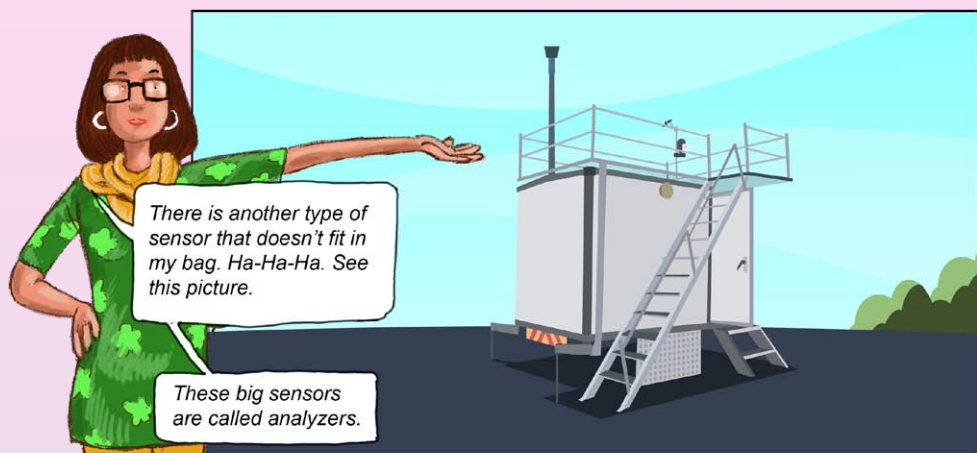












On the other hand, AQI above 400 is severe. It affects healthy people and seriously impacts those with existing diseases.

Keep this AQI chart in your school. It will help you decide when not to play outdoors if the pollution level is high.

| AQI Category        | AQI     | Concentration range* |                   |                 |                |         |                 |                 |         |
|---------------------|---------|----------------------|-------------------|-----------------|----------------|---------|-----------------|-----------------|---------|
|                     |         | PM <sub>10</sub>     | PM <sub>2.5</sub> | NO <sub>2</sub> | O <sub>3</sub> | CO      | SO <sub>2</sub> | NH <sub>3</sub> | Pb      |
| Good                | 0-50    | 0-50                 | 0-30              | 0-40            | 0-50           | 0-1.0   | 0-40            | 0-200           | 0-0.5   |
| Satisfactory        | 51-100  | 51-100               | 31-60             | 41-80           | 51-100         | 1.1-2.0 | 41-80           | 201-400         | 0.5-1.0 |
| Moderately polluted | 101-200 | 101-250              | 61-90             | 81-180          | 101-168        | 2.1-10  | 81-380          | 401-800         | 1.1-2.0 |
| Poor                | 201-300 | 251-350              | 91-120            | 181-280         | 169-208        | 10-17   | 381-800         | 801-1200        | 2.1-3.0 |
| Very Poor           | 301-400 | 351-430              | 121-250           | 281-400         | 209-748*       | 17-34   | 801-1600        | 1200-1800       | 3.1-3.5 |
| Severe              | 401-500 | 430+                 | 250+              | 400+            | 748+*          | 34+     | 1600+           | 1800+           | 3.5+    |

\*CO in mg/m<sup>3</sup> and other pollutants in µg/m<sup>3</sup>; 2h-hourly average values for PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub>, and Pb, and 8-hourly values for CO and O<sub>3</sub>.

Do you know that you can judge these levels by observing the sky and the weather too?

During winter, due to low temperatures, the density of the air increases and it stays close to the ground, trapping pollutants. So the air quality is likely to be bad. While in the monsoon...

...particulate matter is washed away and we have clear days for outdoor activities. Similarly warm afternoons get windy and well ventilated resulting in better air quality.



You can install a small and low-cost air quality sensor in your school for real-time air pollution monitoring in your area. This will help you monitor particulate matter concentration.

You can also install a small weather station which will help you measure temperature, relative humidity, atmospheric pressure, wind speed, wind direction and rainfall.

This is very interesting, Professor Kumar. We could start a summer science project. Our students can monitor air quality and weather as Citizen Scientists and share their observations with you.

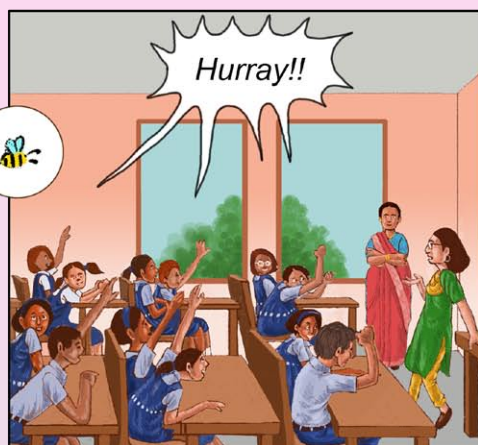
Please enroll us in this project. We want to learn how air pollution is measured.

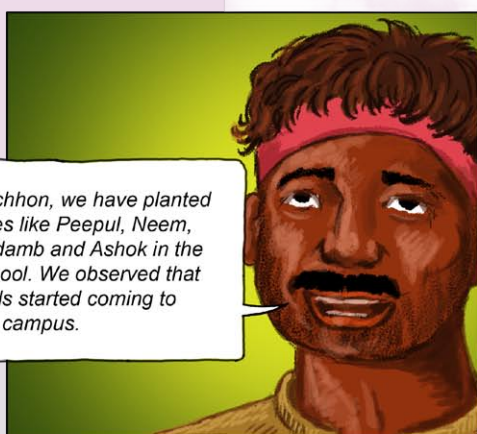
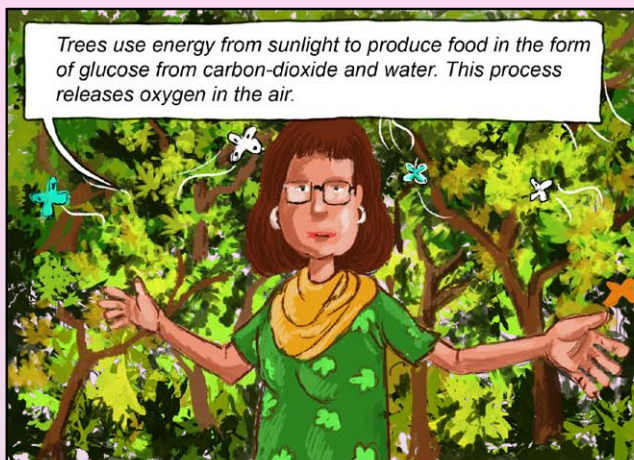
Certainly! Let me tell you about the Community Science Project on Air Quality developed by Earthwatch Institute India and Ericsson India.

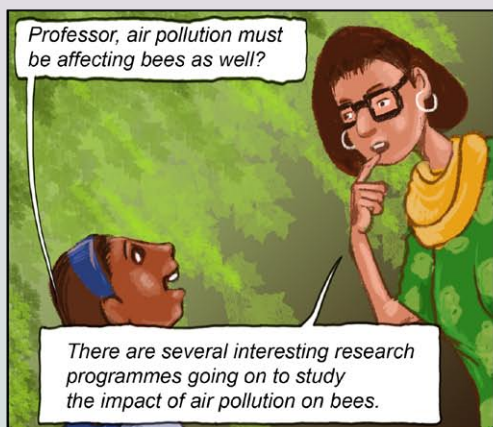
I will be happy to be a guide in your project.

The project aims to build public enthusiasm for accessing air quality data to understand air pollution. You can look up this project on [www.EarthwatchIndia.org](http://www.EarthwatchIndia.org)











Wowww!  
It is truly amazing!  
I like this discussion



I see a lot of bees and butterflies  
around our campus.



And many birds too.



Look, on the one hand doctors, scientists and teachers  
are trying to do things that can help improve our  
understanding on air quality and pollution, and here you  
can see Bhuvnesh bhaiya is doing his best by planting  
trees.

So, now you know why I brought all of  
you outside, right?

Yes, Professor!

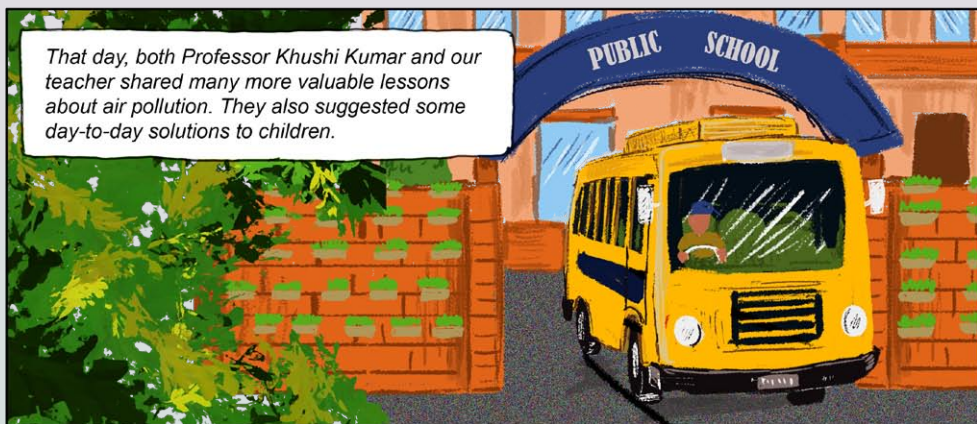
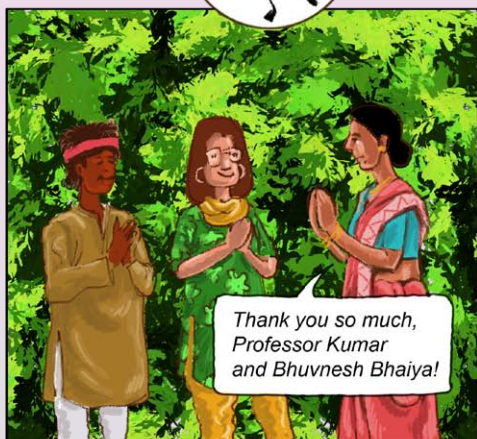


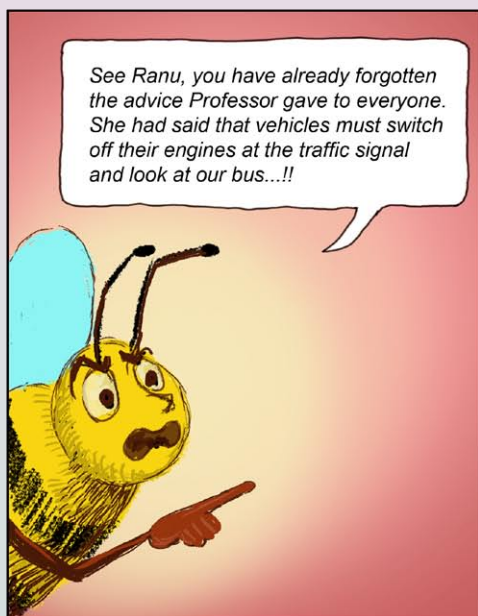
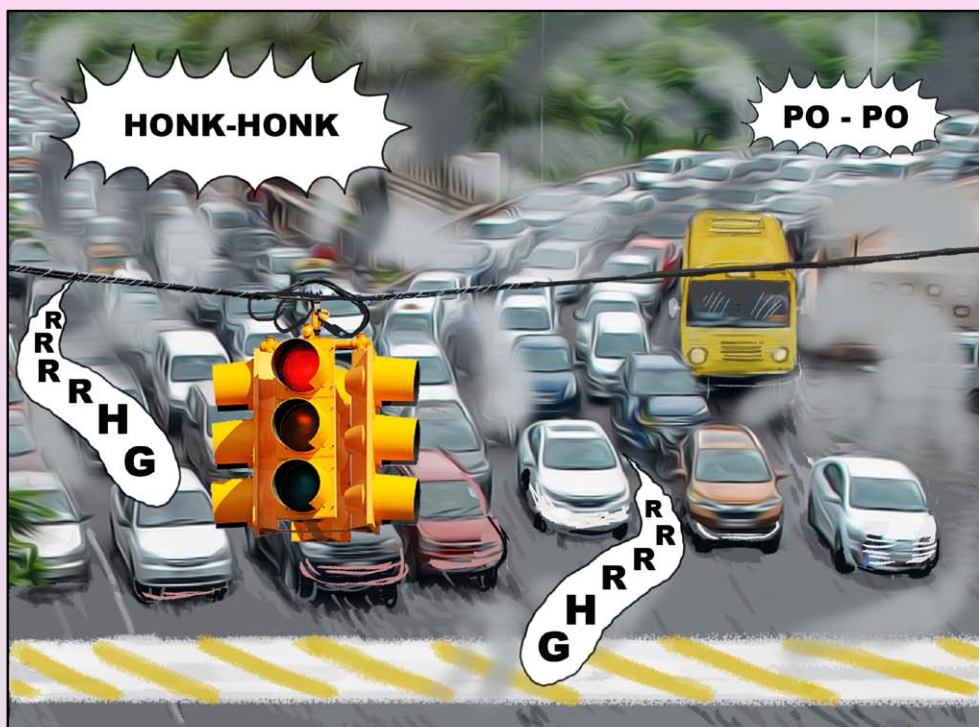
*Planting trees has many benefits. Green walls on both sides of the road help reduce spread of the pollutants sideways. Trees reduce soil erosion, provide shelter to birds and cool the surroundings. Now we have started covering most part of our school walls with green plants.*

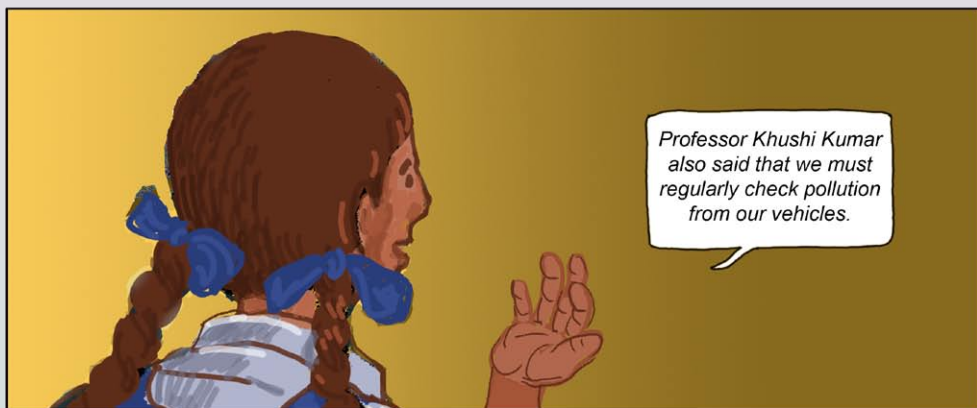
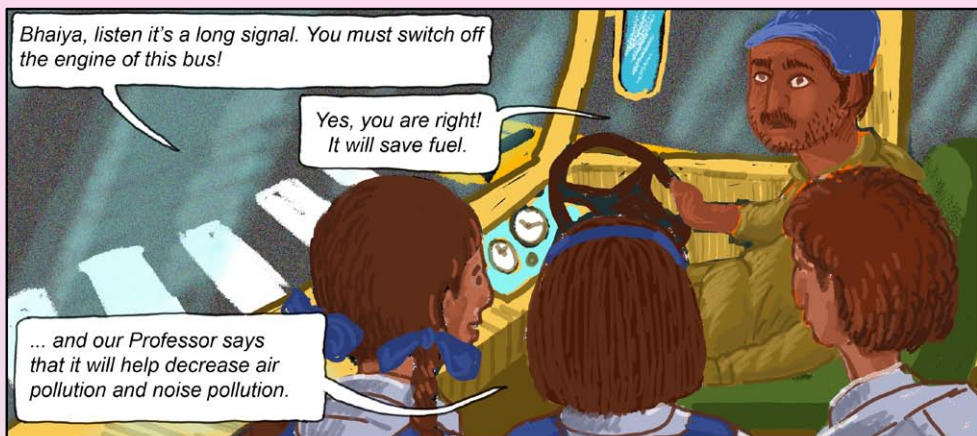
*Hmmm...  
interesting!*

*You can also see these kinds of plants  
in many other places in the  
city such as under the flyovers.*



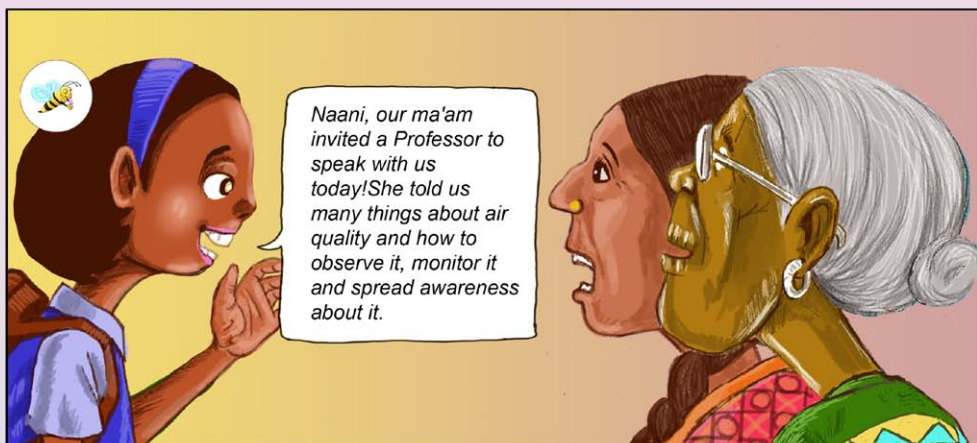












Yes, she told us that cough and asthma are triggered by air pollution. So Naani and older people should try and remain far away from it. They should stay indoors during peak pollution time, like mornings and evening. We should use public transport and also avoid burning garbage.

We will start a Community Science Project on Air Quality with Earthwatch Institute India and install a small air quality sensor in our school to monitor air pollution 24x7. I wish we had a similar sensor at home so that Naani can see pollution-related information before stepping outdoors.



Excellent, Ranu!

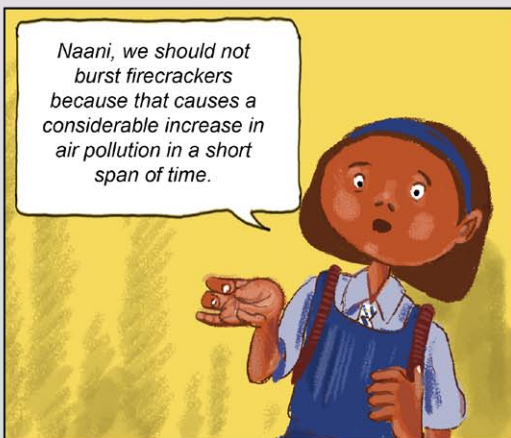
It makes so much sense. Yes, you are correct in pointing out these issues. Medicine is not the only solution for my breathing problem.

We must try and do all these things at an individual level as well to improve air quality.

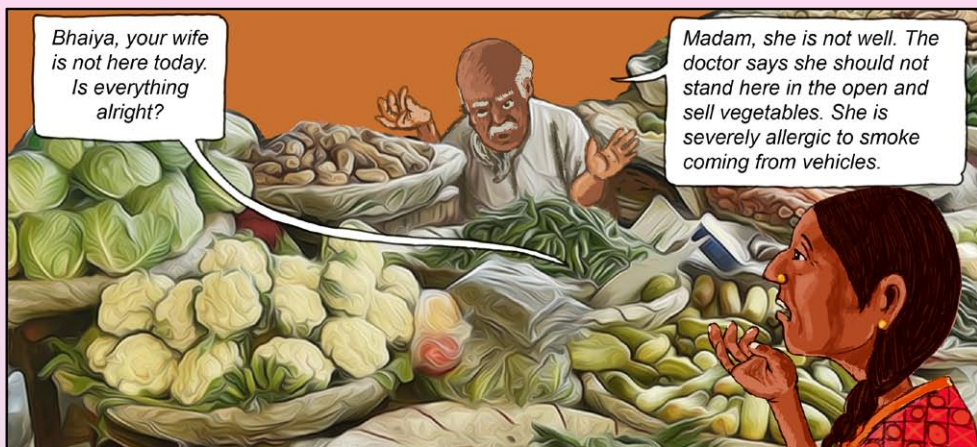
We all should use more public transport or carpool daily and yes, wear masks when the pollution level is high.



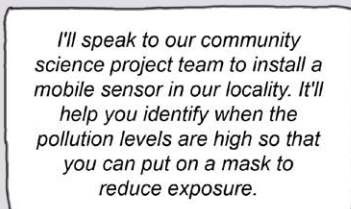
Naani, we should not burst firecrackers because that causes a considerable increase in air pollution in a short span of time.

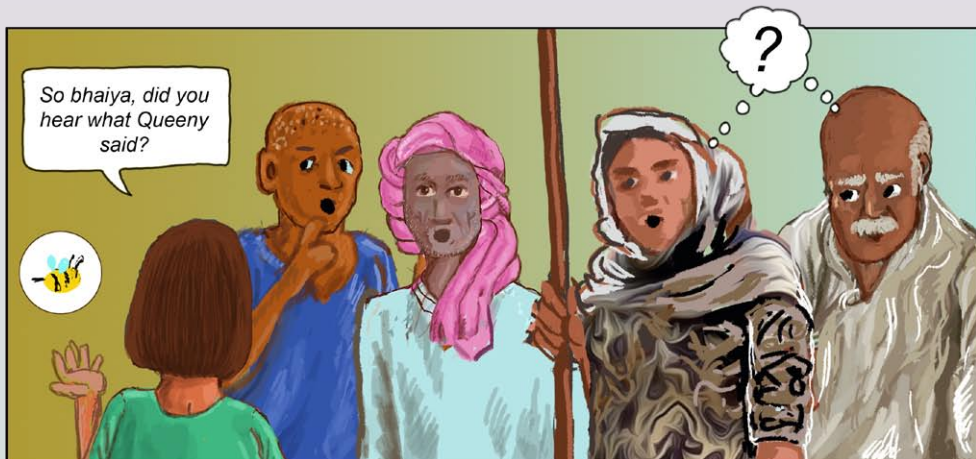
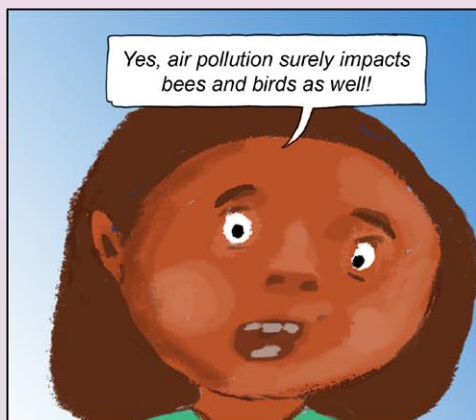
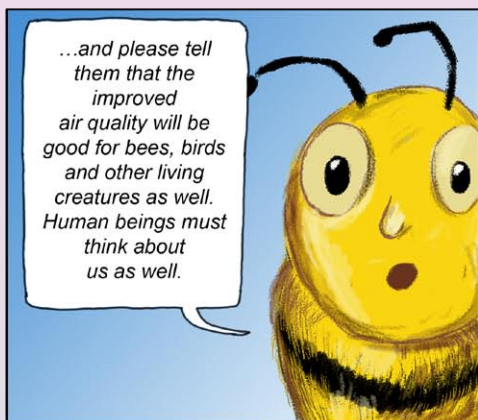
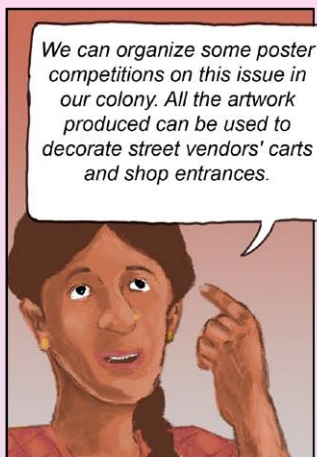
















Back at home

Ranu, yesterday I learnt a lot from you about air quality and its impact on health. Lets invite the pulmunologist, the doctor who examined your naani.

Remember he saw your grandma when she had that severe bout of cough. He was talking about air pollution and its impact on health. I want to invite him to take a session on this subject at my office.



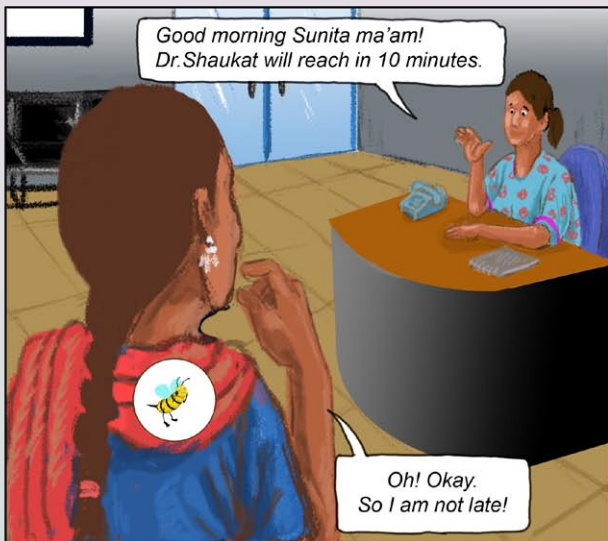
Sure, Ma, it's an excellent idea! What did you say? plumo...

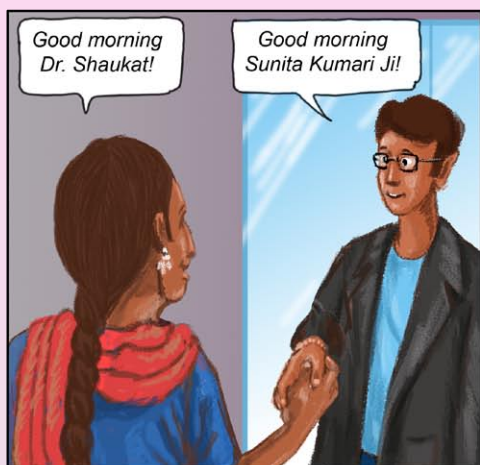


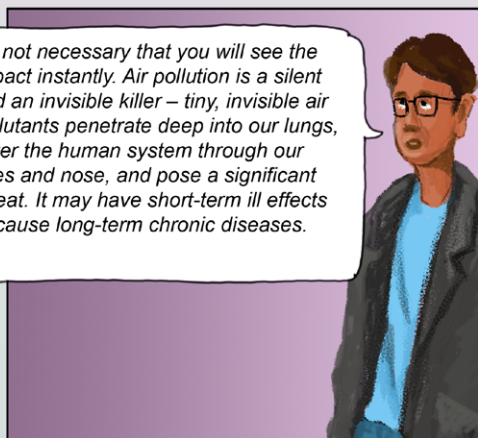
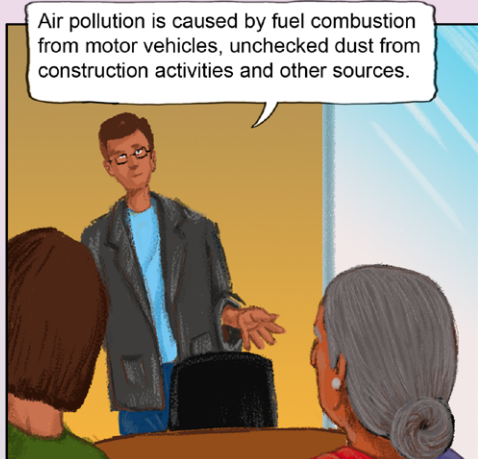
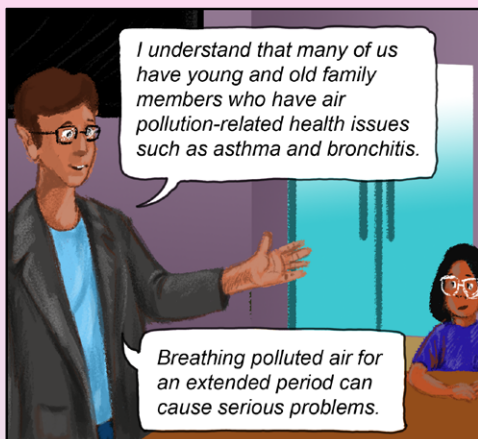
Pulmonologist is a doctor who specialises in addressing respiratory problems.

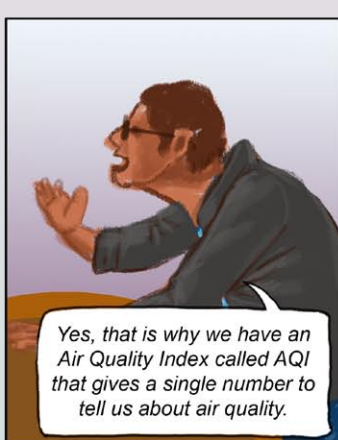
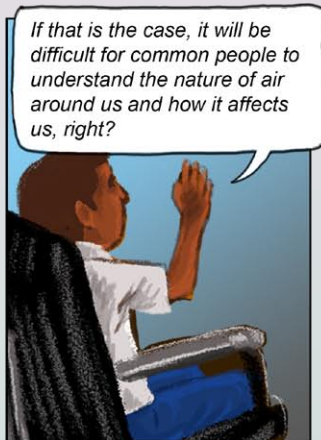
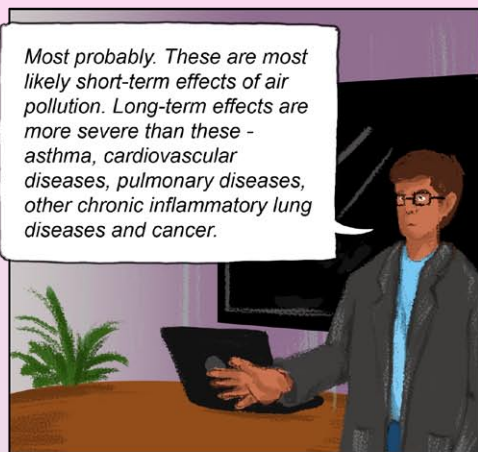












| AQI Category        | AQI     | Concentration range* |                   |                 |                |         |                 |                 |         |
|---------------------|---------|----------------------|-------------------|-----------------|----------------|---------|-----------------|-----------------|---------|
|                     |         | PM <sub>10</sub>     | PM <sub>2.5</sub> | NO <sub>2</sub> | O <sub>3</sub> | CO      | SO <sub>2</sub> | NH <sub>3</sub> | Pb      |
| Good                | 0-50    | 0-50                 | 0-30              | 0-40            | 0-50           | 0-1.0   | 0-40            | 0-200           | 0-0.5   |
| Satisfactory        | 51-100  | 51-100               | 31-60             | 41-80           | 51-100         | 1.1-2.0 | 41-80           | 201-400         | 0.5-1.0 |
| Moderately polluted | 101-200 | 101-250              | 61-90             | 81-180          | 101-168        | 2.1-10  | 81-380          | 401-800         | 1.1-2.0 |
| Poor                | 201-300 | 251-350              | 91-120            | 181-280         | 169-208        | 10-17   | 381-800         | 801-1200        | 2.1-3.0 |
| Very Poor           | 301-400 | 351-430              | 121-250           | 281-400         | 209-748*       | 17-34   | 801-1600        | 1200-1800       | 3.1-3.5 |
| Severe              | 401-500 | 430+                 | 250+              | 400+            | 748+*          | 34+     | 1600+           | 1800+           | 3.5+    |

\*CO in mg/m<sup>3</sup> and other pollutants in µg/m<sup>3</sup>; 2h-hourly average values for PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub>, and Pb, and 8-hourly values for CO and O<sub>3</sub>.



Yes, the sensor measures the amount of significant pollutants present around us, and from this, we calculate AQI.

I'll explain it to you. Let us see this chart. The AQI is shown as different bands of colour which show the different levels of impact it has on our health. Let me show you a few slides to explain how it works.

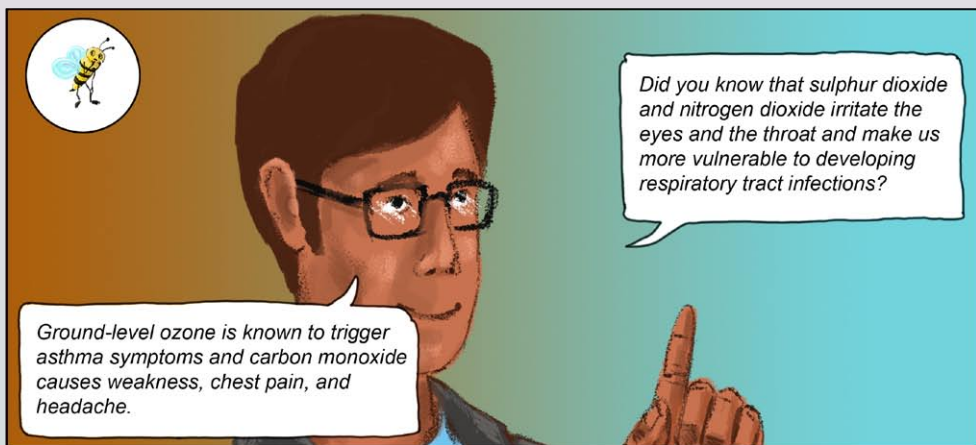
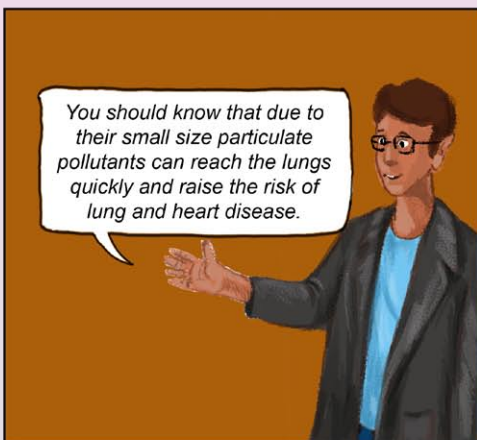
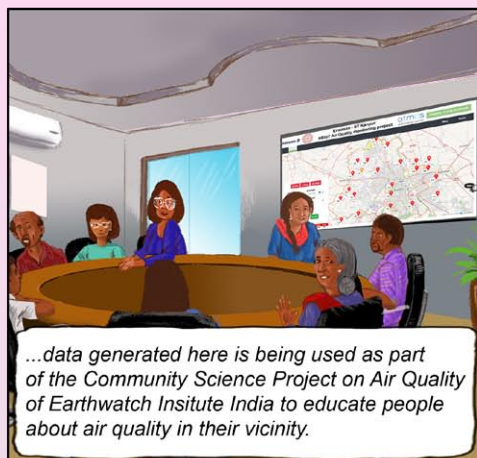
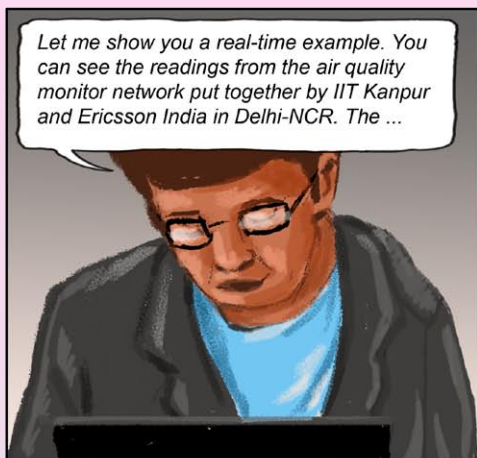
As you can see in the chart, if AQI is 0 – 50, the air is good to breathe. At this range, you can see that levels of PM 10, PM 2.5, nitrogen dioxide, ozone, carbon monoxide, sulphur dioxide, ammonia and lead are at manageable levels.

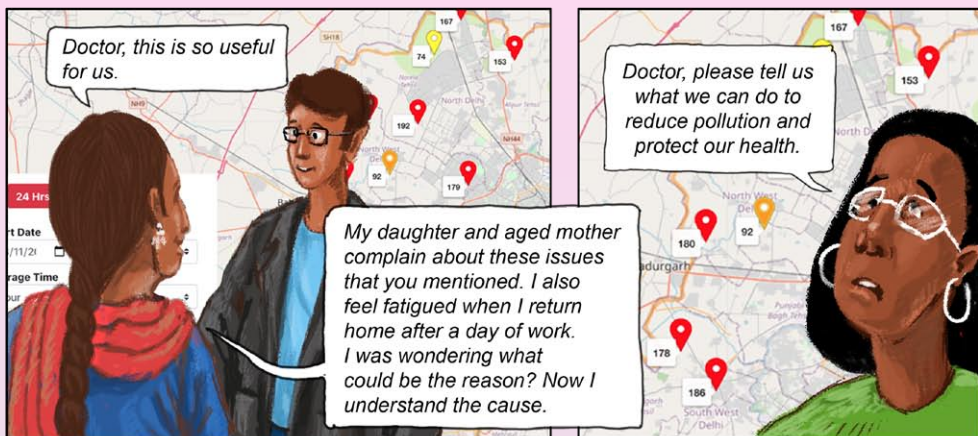


On the other hand, when the AQI is 400 and above, the air quality is really bad.

Hmmm...interesting!  
I must tell Ranu all of this!



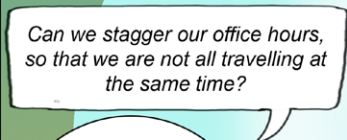




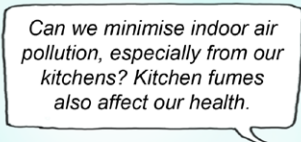
We can even avoid travelling during peak times when the pollution level is high.



How about planting more trees in our office complex?



Can we stagger our office hours, so that we are not all travelling at the same time?



Can we minimise indoor air pollution, especially from our kitchens? Kitchen fumes also affect our health.



We should also organize regular pollution checks for all our vehicles.



No firecrackers, and do not burn waste, especially plastic waste, and please cover construction sites to avoid dust from getting in the atmosphere.



Great! You all are absolutely right. You can drive to the office with your friend who stays close by right? That will help reduce the number of cars on the road – don't you think this has an impact?

You can even walk or bicycle for grocery and vegetable shopping.

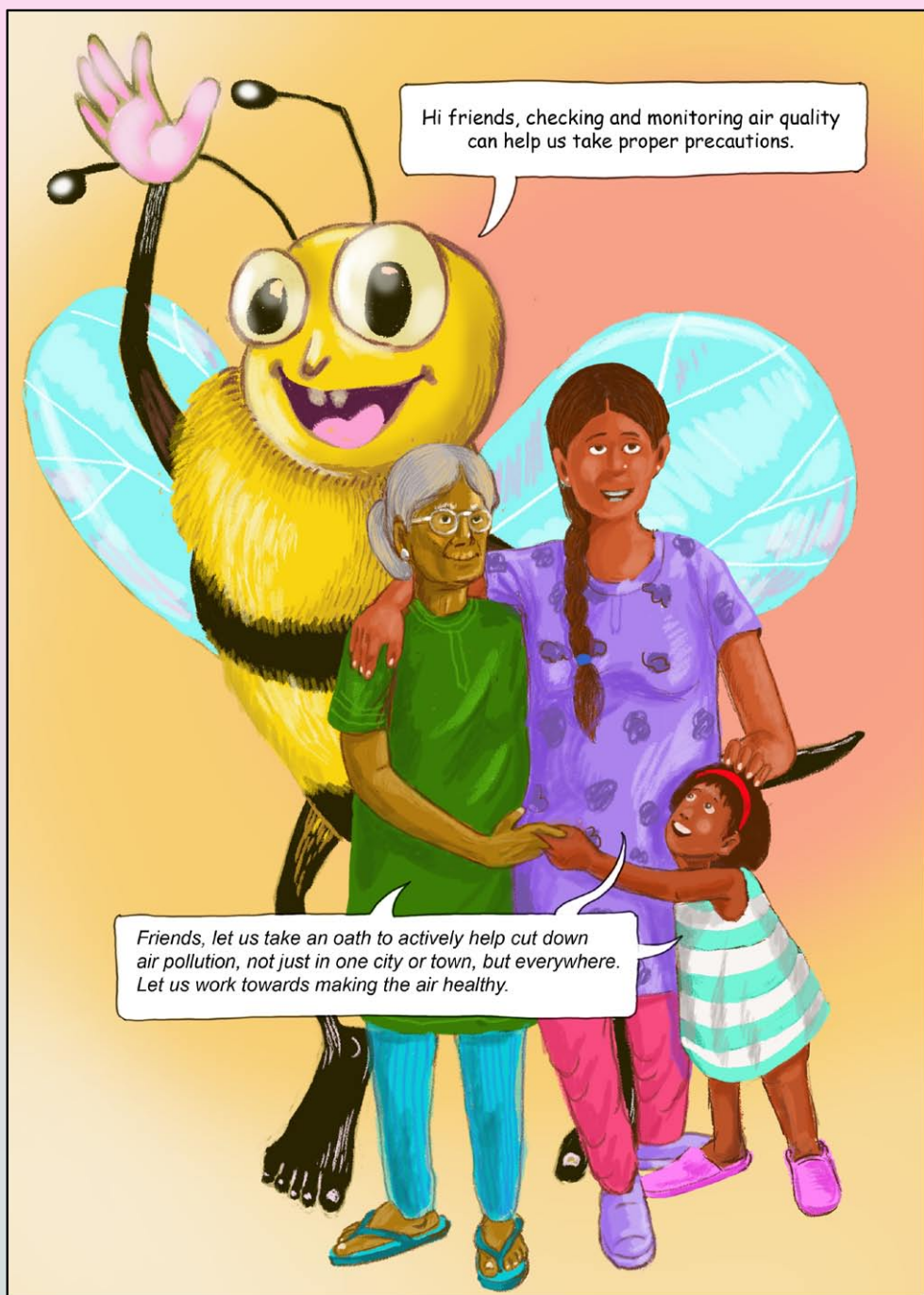
See, these small lifestyle changes save you money, make you active and protect the environment too.





After a few days the market place looked transformed, thanks to the efforts of the street vendors!





## References / further reading

[www.EarthwatchIndia.org](http://www.EarthwatchIndia.org)

[www.lcf.org.in/ill-effects-air-pollution-human-body/](http://www.lcf.org.in/ill-effects-air-pollution-human-body/)

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The Community Science Project on Air Quality will enable cities to better understand the pollution levels by creating awareness amongst residents and authorities, leading to better air pollution management. At Ericsson, we are committed to working with partners across and beyond the ICT ecosystem to improve lives and build a sustainable future.

### ERICSSON

[www.ericsson.com/en/about-us/sustainability-and-corporate-responsibility/india](http://www.ericsson.com/en/about-us/sustainability-and-corporate-responsibility/india)

The Community Science Project on Air Quality works with scientists and researchers, air quality experts, local community members, teachers and students as citizen scientists. The programme helps us understand the causes and sources of air pollution, interpret the air quality index, and provide easy-to-understand information regarding the impact of air pollution on health.

This comic book, written in a simple and easy-to-understand language, will help build a public understanding of air quality. It will create enthusiasm in accessing air quality data and mobilize support towards taking positive individual and collective actions to improve air quality.

The community science programme encourages personal behavioural change to build safer and healthier communities.

### Earthwatch Institute India

[www.EarthwatchIndia.org](http://www.EarthwatchIndia.org)



This is a story of Ranu and Queeny on a learning journey about air quality, how it impacts our health and how we can take positive actions individually and collectively to improve air quality and reduce our exposure to air pollution.

