+ GREEN SCHOOLS | COVER STORY | NEAR AND DEAR

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A DOWN TO EARTH SUPPLEMENT FOR THE YOUNG AND CURIOUS

THE MASK TASK

When corona spreads over all seasons,

And its variants keep playing treasons,

Don't let lockdowns become prisons,

Please mask up for all reasons!

Green School

Neerja Bhatnagar

GREEN WARRIORS

Reforming environment education through experimentation, self-initiatives, mass media, popular publications, schoolwork, and activism

The planet that we have today with us is a gift from Mother Nature. In fact, the Nature has also played a very vital role in evolving the human species. However, we are well aware of global warming and the damage it has done to our green Nature. A solution to this problem lies in our education, which will make us aware and motivated to act judiciously. What we should not forget is that if we ignore Nature, Nature will also ignore us.

Time has come to reorient our education and redefine its curriculum's objectives. Environmental education and climate change should be incorporated as integral parts from early school up to the college level. Gradual and continuous understanding gathered during this journey will help students solve many climate problems through metacognitive information.

Further, these environmental sciences should also be integrated with many other subjects. Such an interdisciplinary approach will empower our kids with the knowledge, skills, values, and training required for understanding various ecological issues effectively. It will help them become a problem-solver and address various global issues holistically. They will also feel better-equipped to take mindful decisions at several individual and collective levels.

Considering these essentials, our present education system hardly meets the need of the hour. It lacks the relevant content, reasoning, facts, figures, and practical experience to teach the young kids about multiple rising environmental challenges. To leave no void in this learning curve, we need to develop a well-defined methodology.

Further, in the present scenario, many teachers are unaware of the scientific explanation behind climate change. Hence, there is an urgent need to train them using informative instructional materials aligned with their subject-expertise. Climate change should no longer be side-lined as irrelevant but seen in tandem with the current educational requirements. A comprehensive education can empower both our students and teacher to become powerful change agents.

At the Bal Bharti Public School, Noida, we follow some qualitative pedagogical strategies that help students understand different environmental phenomena with clarity. This ingrains their minds with creative solutions to overcome routine climate adversities.

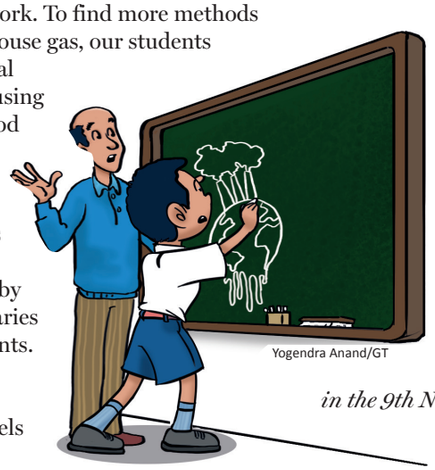
LEARNING-BY-DOING: One of the best ways to motivate students towards environmental conservation and sustainability is by practising learning-by-doing. Lab experiments can be among the most fun-loving and engaging activities among them.

How global warming happens? What causes pollution?... Such questions can be best answered by using simple lab devices. For instance, greenhouse effect can be explained using plastic wrap to trap the sun's heat. The effect of black carbon on the pace of melting ice can be displayed by burning charcoal in the science lab.

Yogendra Anand/GT

YOUR OWN BACKYARD: It is well said that our first lessons begin at home. To bring this thought alive, we have built a compost pit in our school. It exhibits in a miniature form how methane-producing landfills work. To find more methods to reduce this greenhouse gas, our students connected with several NGOs, and began reusing food and reducing food wastage.

MOVIE SCREENING: Among the best ways to spread awareness on climate change is by screening documentaries and movies for students. *Before the Flood* is a movie about a protagonist who travels to different continents, including the Arctic, to survey the effects of rising temperatures. *An Inconvenient Truth* and its sequel is a campaign by the former United States Vice President Al Gore to educate the masses about global warming. Apart from these, there are numerous documentaries by the National Geographic to showcase.



Yogendra Anand/GT

NEWSLETTERS AND JOURNALS: Magazines like *Gobar Times* and *Down to Earth* help our students connect between what they are studying inside the classroom with what is happening outside it. Reading about various issues related to sustainability, will help them find new paths leading towards a greener, cleaner, and healthier planet.

ASSIGNMENTS: Research projects, debates, webinars, workshops, classroom presentations, and student discussions go a long way in training children on various topics. Even poster-making for school display boards on themes like plastic wastage, minimalism, ozone depletion, water conservation, etc. can build a lot of awareness on environment conservation.

CAMPAIGNS AND RALLIES: Our Bal Bharti Public School, Noida takes pride in working towards the UN Sustainable Development Goals, 2030. Our initiatives include spreading awareness through demonstrations and creative videos.

Summing up, it is time to rethink and introspect upon our role as curriculum designers and educators. In order to nurture future green warriors to beat our unforeseen environmental problems, let us help every child to feel the pulse of our Mother Earth. Reiterating the mantra: 'Together we can and we will be the change to bring the change.'

The author is the Environment Club Head and the Green Schools Programme Coordinator of the Bal Bharti Public School, Noida. Her presentation on environment education received 'Meritorious Teacher' award in the 9th National Teachers Science Congress, Ahmedabad, 2018.

Caption: Students participating in several awareness-building campaigns

Green School

Cover Story

UNMASKING MASKS

Masks – and a raging debate about which ones to use and when – are all the craze. Get a quick lowdown here on the mask mania.

Dr Gursimrat Sandhu and Souparno Banerjee

Yogendra Anand/GT

N95 or a simple cotton one stitched up by the friendly neighbourhood tailor? A regular surgical one or one with a designer look and feel? Double mask or a single one? The Covid-19 years have got all of us in a tizzy over this small piece of cloth which we are told is the first line of defense against the virus. Or any virus or allergen, for that matter. The mask has become an inseparable part of our daily dress. Like our handkerchiefs or our wristwatches or our mobiles, we cannot think of stepping out without them. They have even become a fashion statement!

How useful are these masks actually? Should we use different kinds of masks against different threats: Covid-19, polluted air, Delta variant of the virus, or the Omicron variant? Let us explore and dig around a little bit about all these masks...

The name 'N95' means the mask blocks about 95 per cent of the particles that are 0.3 microns in size or larger

Why Do We Need Masks?

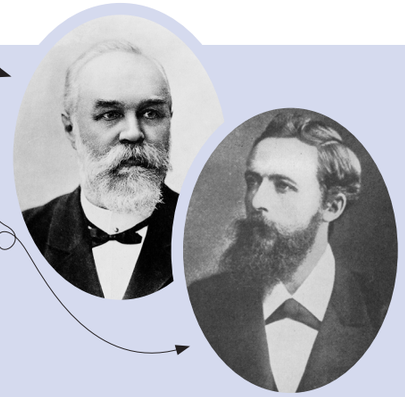
One thing is absolutely clear. Science and scientists say masks are very useful and can save lives in different ways. They can reduce the chance of transmitting the virus as well as that of getting infected by them. Some studies are also saying that using a mask might bring down the severity of the disease from an infected person. The World Health Organization (WHO) says that simple things can greatly help in protecting people against this disease. Mainly: using clean, fitted masks; washing hands frequently or sanitizing; maintaining social distance in public places; and getting vaccinated. The United States' Centers for Disease Control and Prevention (CDC) recommends that everyone, two years or older, should wear a well-fitted mask.

Connected to the subject of masks is the question of how exactly does the coronavirus travel and infect us. When a person breathes, talks, sneezes, or coughs, she or he spits out a fine spray of liquid particles. Some are large and are called droplets; others are microscopic, and categorised as aerosols. Viruses can hitch a ride on these particles. Droplets can shoot through the air and land on a nearby person's eyes, nose, or mouth to cause infection. But gravity quickly pulls them down. Aerosols, by contrast, can float in the air for minutes to hours, spreading through an unventilated room and infecting others.

FACE MASKS IN HISTORY

The first face masks were made to combat plague. A plague that ravaged Europe and Asia from the 14th to the 17th centuries is estimated to have killed around 200 million people in the 14th century alone. The doctors curing plague put on bird-beak masks, in which the beaks were filled with a mixture of herbs. This mixture included garlic and rue to block the smell of the dead and dying. This 'mask' was also believed to neutralise the 'miasma' (meaning, oppressive or unpleasant smell) in the air which was thought to be the cause of the illness.

In 1899, the Polish bacteriologist Carl Flugge showed that when we talk, we can spit out respiratory droplets containing bacteria. This led his colleague named, Johann Mickulicz-Radecki, to create and wear a face mask. He described it as a "piece of gauze tied by two strings to the cap, and sweeping across the face so as to cover the nose, mouth, and beard". In 1905, an American doctor Alice Hamilton proposed that doctors should wear masks. That was because he believed that diseases—like, scarlet fever, which were very common in those days—were transmitted through droplet infection. He recommended doctors to wear masks at the time of surgery, which may have been the first such recommendation.



Cover Story

During the Manchurian Plague of 1910-11, people used cotton masks somewhat similar to what we use today. The next big thing was the Spanish Flu epidemic of 1918-19 during which the wearing of masks was mandatory for medical workers, police officers, and citizens of some American cities. People in San Francisco were fined US $5 if they were caught in public without a mask. In fact, the use of face masks was thought to have played an important role in helping stop the spread of the disease.

Standardisation and testing of face masks for their effectiveness began seriously during the 1950s. Many of the changes in the design and manufacturing of face masks that took place in those years hold true even today. For instance, it was discovered that the material used for making a mask is as important as the fitting of a mask on our face; or that masks quickly lose their capability to filter properly once they get wet.

Respirator-type masks, like the N95, were originally developed in the mining industry in the USA. They were meant to protect the miners from the mining dust and other toxic particles in the air inside a mine. In the 1990s, the medical fraternity adapted these masks for their own use. Hence, the use of masks began.

Scientists believe that aerosols could be the most critical transmission vehicle for Covid-19.

Which Mask Should We Wear?

So, what kind of masks should one opt for? Cloth masks can block around 10 to 30 per cent of aerosol-sized particles. Then there are medical masks, which could be simple triple-layer surgical masks or the more sophisticated respirators. Research done by the Max Planck Institute in Germany has found that tight-fitting FFP2s (Filtering Facepiece, type 2) can provide 75 times better protection against a coronavirus than a simple surgical mask. For those who cannot afford or access these highly sophisticated or expensive masks, CDC advisory is still that 'any mask is better than no mask'. Most importantly, for any kind of mask to be effective, it has to be clean, well-fitted, and worn properly.

With the emergence of the Omicron variant, the latest advice from scientists is to preferably go for the N95 or KN95 masks. It is supposed that these masks are able to filter out 95 per cent of the particles from the inhaled air, including respiratory droplets and minute aerosol particles. As per our very own Ministry of Health and Family Welfare, one can use both the triple-layer medical or surgical mask and an N95 mask. However, let us give you a word of caution – do not use an N95 mask with a one-way filtration system. This kind will protect you only by filtering inhaled air but will not protect people nearby you from the air you breathe out. This kind of mask, therefore, is not effective in stopping the transmission of the virus.

All said and done, masks do help in keeping ourselves and others relatively safe. But in the case of Covid-19, it is equally critical to follow other protocols, such as maintaining a safe distance and washing hands.

You know that we breathe in oxygen (O_2) and breathe out carbon dioxide (CO_2). But when we wear a mask, does the exhaled CO_2 remain trapped inside our mask? Do we end up breathing in too much CO_2 when we inhale the next time? Well, no.

Why? Because the CO_2 escapes through the mask into the air when we breathe out or talk. CO_2 molecules are tiny and can easily pass through the mask material. In contrast, the respiratory droplets that carry the Covid-19 virus are much larger, so they cannot pass as easily through a properly designed and properly worn mask. Hence, please wear a mask, for sure!

Source: Centers for Disease Control and Prevention, USA

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EYE ON YOU

Indian White-Eye—when beauty lies in the eyes of the beholder

Gargi Mishra

Whenever that sweet tinkling sound traverses through my balcony, my entire mood rejuvenates. I crane my neck, investigating its source, and scan my lushy green enclave for a soft jingling song. Tracing the *tsee...tseer...* notes, I rejoice with delight on spotting the chirpy, cute, bundle of joy—the Indian White-Eye.

Do you think the White-Eye is called so because it wears white spectacles? If yes, then you are absolutely correct! A ring of white feather around its eyes has earned this birdie its English title. In fact, it was originally named the 'Oriental White-eye' but later coined the 'Indian White-eye,' for geographical specificity. So quintessential is this chalky-white circle that even the species' scientific name refers to this identification mark. *Zosterops palpebrosus*: where '*Zosterops*' means 'girdle eyes' in Greek and '*palpebrosus*' means 'prominent eyelids' in Latin.

This sober acrobat displays yellowish olive-green upper body and greyish-white undersides. This contrasts with its bright yellow throat and vent, and its black curved bill. With short wings and squarish tail, it slenderly migrates in local areas—forests, orchards, and groves.

Diligently sucking the flower nectar and gulping down the pulpy berries, the White-Eyes are crucial pollinators. No wonder they celebrate a flower feast in my garden, not just in ones or twos but it in whole large groups! Primarily insectivorous, these White-Eyes are very sociable and enjoy living collectively. Their husband-wife pair are also alike.

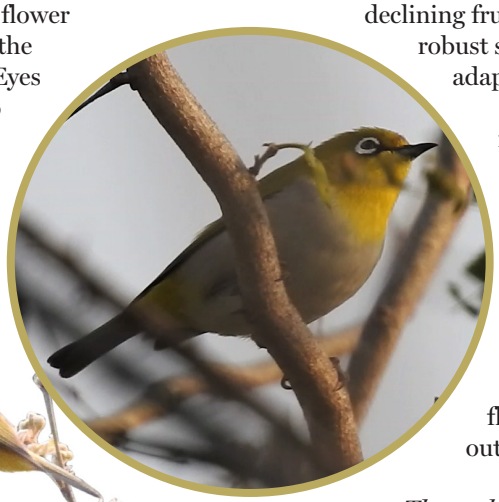

PHOTO: ATHIYA MAHAPATRA

One day, my daughter spot a White-Eye couple in our neighbourhood. The duet was busy gathering some nesting materials. By the time we traced their construction site, the pair had already weaved a beautiful cup-nest using cobwebs, cotton, soft feathers, and plant fibers. Innocent, my baby daughter demanded, "I wanna stay there. Can I fit myself into it?"

After a few days, we noticed three beautiful pale-blue eggs resting inside this new abode. We observed a parent ferrying food for the chicks, so we remained aloof to avoid any disturbance. In fact, a greater threat to them is habitat degradation, declining fruit trees, and rise in predators and robust species, i.e., those who are more adapted to their environment.

Sometime later, the nest remained intact but its residents had abandoned it; probably, the fledglings had taken their flight. Howsoever tiny the White-Eye, it did give a thought to my doll and I. Till now, my princess is comforted in a world her parents built for her, but in a few years, she too will have to take her flight and explore the wide world outside.

The author is an amateur ornithologist and closely follows the avian world.

Ritika Bohra/GT

Electric cars cause zero emissions. In towns and cities, where there is heavy automobile traffic, Electric Vehicles (EVs) can help reduce carbon dioxide, other greenhouse gases, and also fine particulate emission by a phenomenal level. With the use of EVs, there will be no unhealthy exhaust, which means, less pollution!