

Quest ...a monthly Science and Mathematics
magazine...

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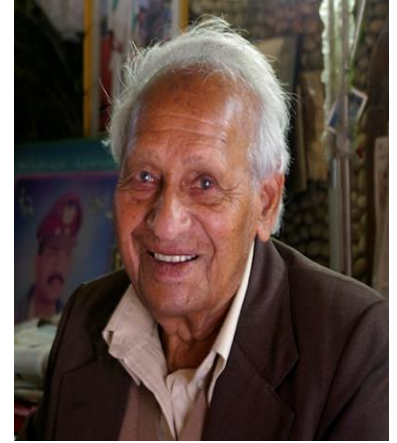
By..Mrs Arvinder Kaur and Mr Vasudevan

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IDENTIFY HIM:

- He was a self-taught artist.
- He toiled away secretly in the dead of night for 18 years to create his dream garden.
- Riding his bicycle after dark to a state-owned forest, he spent night after night clearing patches of ground and transforming the landscape into a majestic garden that would eventually cover over 20 acres.
- He did it by recycling objects from garbage (solid waste) that people had thrown away.



What is solid waste?

- Solid waste refers to the range of garbage arising from animal and human activities that are discarded as unwanted and useless.
- Solid waste is generated from industrial, residential and commercial activities in a given area, and may be handled in a variety of ways. As such, landfills are typically classified as sanitary, municipal, construction and demolition or industrial waste sites.
- Waste can be categorized based on material, such as plastic, paper, glass, metal, and organic waste.
- As solid waste management is a critical aspect of environmental hygiene, it needs to be incorporated into environmental planning.

Waste Generation in India:

- According to the Press Information Bureau, **India generates 62 million tonnes of waste** (mixed **waste** containing both recyclable and non-recyclable **waste**) every **year**, with an average annual growth rate of 4%.
- Landfills across India are overloaded and it is estimated that if waste generation is not reduced, then by 2030 the waste generation is likely increase to 165 million tonnes from 62 million tonnes
- Out of the total waste generation, more than 45 million tonnes of waste remains untreated, which is a whopping 72%.
- Delhi and Mumbai together generate about **10 million tonnes of garbage** every day.
- If we do not reduce waste and generate it at current rate, India will need 1,240 hectares of land, which is the size of a metropolitan city like Bangalore, to dump country's waste.



India has been among the top 10 countries generating the highest amount of Municipal Solid Waste.

Waste management is the foremost value India needs to adopt if it has to achieve the goal of 100 per cent cleanliness by October 2019.

What is Zero waste?

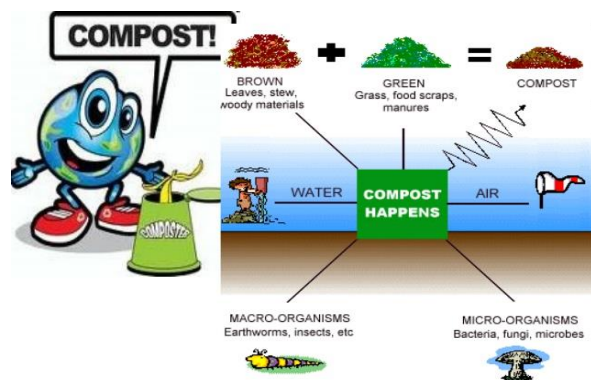
Zero Waste is a philosophy that encourages the redesign of resource life cycles so that all products are reused. **The goal is for no trash to be sent to landfills, incinerators, or the ocean.** The process recommended is one similar to the way that resources are reused in nature.



Tips for Reaching Your Waste Reduction Goals

- Reducing Waste
- Reusing Materials
- Donating/Exchanging Materials
- Recycling
- Re-purposing

- ✓ *Reducing paper waste by implementing a formal policy to duplex all worksheets – printing on both the sides of the sheets.*
- ✓ *It is believed that a family of 4 can easily reduce their waste from 1000 Kg to less than 100 kg every year if they adopt **segregation and composting**.*



- ✓ **Re-purposing your household trash is a good way to reduce waste.**

Instead of throwing the plastic bottles use them to decorate your house and make other plastic showpieces etc.



Biodegradable 'Leaf Plates' Curbs Plastic Pollution

Vertical garden at home made from plastic bottles

Paper is too valuable to waste

Around the world we use 1 million tonnes of paper every day. Too much of this paper usage is wasteful and unnecessary and puts huge pressures on the environment.

Like food, paper has no business in a landfill.



For every ton of paper we recycle, we save:

- 17 mature trees
- 7,000 gallons of water
- 380 gallons of oil
- 4,100 kilowatt hours of electricity—enough energy to power the average American home for six months!
- 3.3 cubic yards of landfill space

When you waste less, you have more to give!

- Alappuzha, a small coastal city in India's southern Kerala state, has shown just how feasible a zero-landfill city model is. It has put the **onus of waste management on its residents: "You generate the waste, it's your job to clean it up!"**
- Muzaffarpur, a city with a population of about half a million, was considered one of the dirtiest in Bihar state not long ago. Today, it's on track to become **one of the cleanest**, following a pilot program with the Center for Science and Environment.

Waste to wonder

- **Nek Chand**, The Legendary Artist Who Spent 18 Years Secretly Building **Rock Garden in Chandigarh**



- A theme park named 'Wonders of the World Park' featuring replicas of Seven Wonders of the World made from waste has been installed in south Delhi. The park which was earlier a landfill will be completely powered by solar energy.



The seven wonders of the world include Great Pyramid of Giza in Egypt, Eiffel Tower in Paris, Leaning Tower of Pisa in Italy, Statue of Liberty in the United States, Christ the Redeemer of Brazil, Colosseum in Italy and Taj Mahal in India.

FROM STUDENT'S DESK:

- Interesting facts:



1. **Lightning is both beautiful, and dangerous**

A lightning strike can reach a temperature of 30,000 C or 54,000 F. About 400 people are hit by lightning each year. Shocking!



2. **Rusty Mars**
Rust makes Mars appear red.

On Mars, iron oxide forms a rust dust that floats in the atmosphere and creates a coating.

3. A human spends about five years of their life blinking. Fortunately, we can do many other things simultaneously.
4. About 100,000 chemical reactions occur every second in our brains.
5. The speed of your sneeze is 160 km/h.
6. There is enough DNA in the average person's body to stretch from the sun to Pluto and back 17 times.
7. Grasshoppers have ears in their bellies
8. There are more trees on Earth than stars in our galaxy.

➤ **Riddles:**

1. I am a plant. I am traditionally used to purify the air. I am used for allergies/ hay fever. I am used for coughs, colds and headaches. I am used to lower blood pressure. I am used for IBS induced stress. I am active against TB and fungal infections.
Who am I?
2. I am a plant. I am a native of Europe and Asia. I am named after the first month of Roman calendar. I am detoxifying and antiseptic. I am known for helping heal during the plague. I am good for varicose veins. I am hormone balancing. I am kind to open wounds.
Who am I?

Answers: 1. Tulsi 2. Calendula

- **Saksham Khanna and Kuhuk of M3-B**



Bhaskaracharya was born in 1114 AD in Biddur, India and died in 1185 AD in Ujjain. He represented the peak of mathematical achievement in the 12th century since he knew and understood number systems, 0 and negative numbers. The knowledge he acquired about solving equations was not to be found in Europe till seven centuries later. Bhaskara was head of the astronomical observatory at Ujjain, the leading mathematical centre in India at that time. Bhaskara's mathematical works include Lilavati (The Beautiful) and Bijaganita (Seed Counting). He also wrote books on astronomy, one of which was Karanakutuhala (Calculation of Astronomical Wonders).

The Lilavati and Sankramana-the rule of concurrence

In Lilavati, Bhaskaracharya explains how the values of two numbers can be found ,given their sum and difference, using a formula. He calls it the rule of **concurrence**.

The sum with the difference added and subtracted being halved, gives the two quantities. This is termed concurrence."

What this means is that if x and y denote the required quantities and $x + y = k$ and $x - y = l$, then $x = (k+l)/2$ and $y = (k-l)/2$.

This can be proved as follows.

$$x + y = k \quad \dots (i)$$

$$x - y = l \quad \dots(ii)$$

$$x = (k + l)/2$$

On subtracting (ii) from (i),

$$x + y - (x - y) = k - l$$

On adding (i) and (ii),

$$x + y + x - y = k + l$$

$$2x = (k + l)$$

$$x + y - x + y = k - l$$

$$2y = k - l$$

$$y = (k - l)/2$$

The Lilavati and Vishama-karman: the rule of dissimilar operation

Vishama- karman means the finding of quantities when the difference of their squares is given along with either the sum or difference.

"The difference of the squares , divided by the difference of their radical quantities gives their sum (or divided by their sum gives their difference) whence the quantities can be found using the rule of concurrence previously discussed"

$$\{x^2 - y^2\} \div \{x - y\} = x + y$$

[Note : This is same as the identity $(a+b)(a - b) = a^2 - b^2$]

Challenges.....

1. Tell me the numbers, the sum of which is 101 and the difference is 25, if you know the rule of concurrence.
2. Tell me what numbers they are, of which the difference is 8 and the difference of squares is 400.
3. Find two positive numbers they are whose difference is 3 and the difference of squares is 51
4. I was paid Rs.60 for every day I worked and was fined Rs 40 for every day I absented myself. I had to work 25 days each month. If I drew no salary for a month, how many days did I absent myself ?