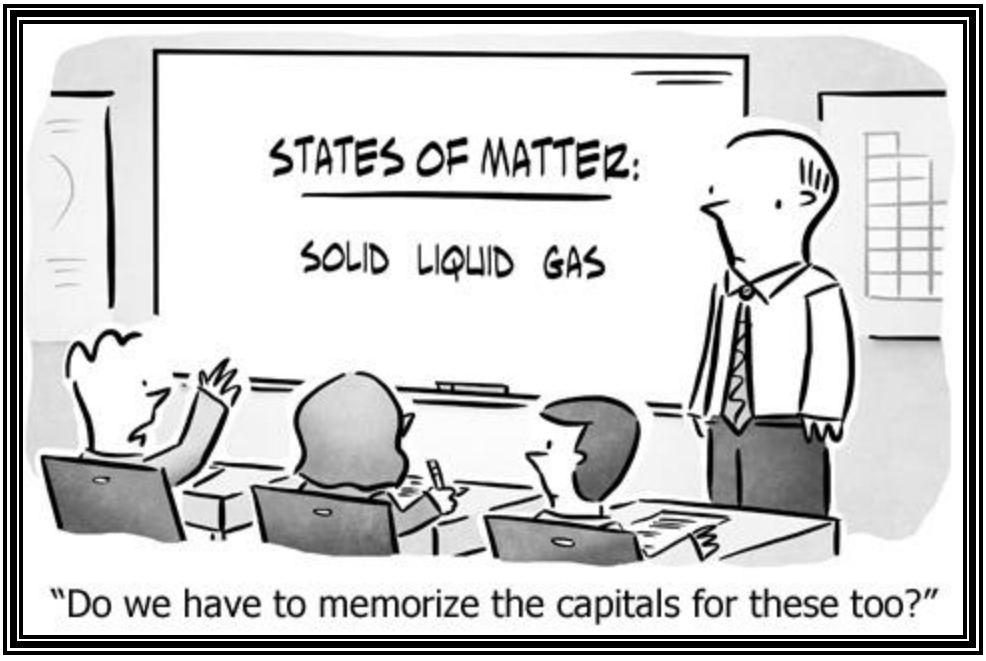
GYAN BHARATI SCHOOL

QUEST.....

Monthly Science and Mathematics magazine

Edition: October 2018

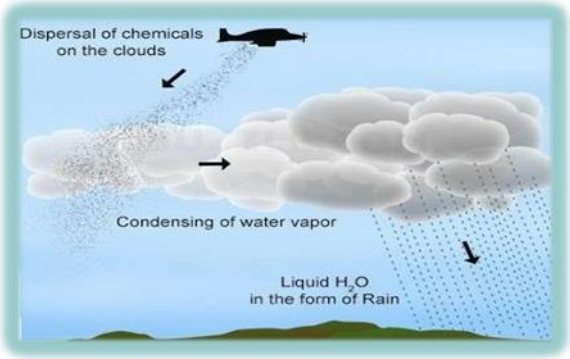


COMPILED BY: Dr. Kiran Varsha & Mr. Sudhir Saxena

ARTIFICIAL RAIN

Cloud seeding, an **artificial** process of **making rain** is done by precipitation, a process of condensation of water vapors in the air.

This is done by using cloud seeding chemicals like potassium iodide, silver iodide, liquid propane or solid carbon dioxide (dry ice), which causes tiny water drops to grow and make rain



IDENTIFY THE SCIENTIST

- Born on 30th October, 1909 in Bombay.
- Played an important role in Quantum Theory.
- Known as the **Father of Indian Nuclear Power**.
- He identified **Meson.**
- The first person to become the Chairman of the Atomic Energy Commission of India.
- He was honored with the Padma Bhushan, the third highest civilian award in India

GREEN CHEMISTRY

Green chemistry emerged from the context of increasing attention to problems of chemical pollution and depletion of resources. It is a step taken to overcome the environmental problem towards prevention of pollution through the new technologies, clean and sustainable chemistry.

TYNDALL EFFECT

The **Tyndall effect**, also known as **Willis–Tyndall scattering**, is light scattering by particles in a colloid, and is named after the 19th-century physicist John Tyndall. When we apply a torch on a glass of milk the path of light becomes visible but it is not so in case of water. The milk particles being colloidal in size scatter the light.

Examples of Tyndall Effect:

- The sky appears to be blue.
- On a foggy day one can see the headlights of the car but not the car.
- Sun is red at sunrise and sunset.
- Ultra-microscope does not render the actual colloidal particles visible but only observe the light scattered by them.
- Opalescent glass appears blue from the side bur orange light shines through.
- On cloudy days sunlight passes through the turbid layer of the clouds or the canopy of a dense forest resulting into a visible path of light.
- Smoke in the exhaust of an engine appears to be blue in colour.
- AND…

The beam of light coming from the famous "Mystery Machine"

DID YOU KNOW?

- You can melt gallium by holding a lump in the warmth of your hand.
- Unlike many substances, water expands as it freezes. An ice cube takes up about 9% more volume than the water used to make it.
- If you pour a handful of salt into a full glass of water, the water level will actually go down rather than overflowing the glass.
- The human body contains enough carbon to provide 'lead' (which is really graphite) for about 9,000 pencils.
- One bucket full of water contains more atoms than there are buckets of water in the Atlantic Ocean.
- Bee stings are acidic while wasp stings are alkaline.
- Hot peppers get their heat from a molecule called capsaicin. While the molecule acts as an irritant to mammals, including humans, birds lack the receptor responsible for the effect and are immune to the burning sensation from exposure.
- By the time you feel thirsty, you've already lost about 1% of your body's water.
- The only elements that are liquid at room temperature are Bromine and Mercury.
- Mars is red because its surface contains a lot of iron oxide or rust.

Srinivasa Ramanujan (22 December 1887 – 26 April 1920)

HARDY – RAMANUJAN NUMBER 1729:

The number 1729 is known as the Hardy–Ramanujan number after a famous visit by Hardy to see Ramanujan at a hospital.

I remember once going to see him when he was ill at Putney. I had ridden in taxi cab number 1729 and remarked that the number seemed to me rather a dull one, but he replied, "it is a very interesting number as it is the smallest number expressible as the sum of two cubes in two different ways."

$$\mathbf{1729 = 1^3 + 12^3 = 9^3 + 10^3}$$

1729 is also known as **TAXICAB** number. The nth **taxicab number**, denoted by Ta(n) or Taxicab(n), also called the nth **Hardy–Ramanujan number**, is defined as the smallest number that can be expressed as a sum of two positive cube numbers in n distinct ways. First 3 taxicab numbers are as follows:

$Ta(1) = 2 = 1^3 + 1^3$

$Ta(2) = 1729 = 1^3 + 12^3$

$= 9^3 + 10^3$

$Ta(3) = 87539319 = 167^3 + 436^3$

$= 228^3 + 423^3$

$= 255^3 + 414^3$

VEDIC MATHS TRICK OF FINDING CUBE ROOTS

Before starting the actual method, following points should be noted:

1. This trick works for cube root of any number having maximum 6 digits.

2. This trick works only for perfect cubes and not for any arbitrary number.

Number of digits in cube root: We can find the number of digits in cube roots using following explanation – Make groups of 3 digits starting from right side. Left most group will have 1 or 2 or 3 digits. Each group will contribute one digit in the cube root. So, we can conclude that cube root of a 4, 5 or 6 digit number will have exactly 2 digits.

We need following tables:

TABLE 1 : CUBE OF NUMBERS FROM 1 TO 10		TABLE 2 : UNIT'S DIGIT OF CUBE ROOTS	
NUMBER	**CUBE**	**CUBE ENDS IN**	**CUBE ROOT ENDS IN**
1	1	1	1
2	8	2	8
3	27	3	7
4	64	4	4
5	125	5	5
6	216	6	6
7	343	7	3
8	512	8	2
9	729	9	9
10	1000	0	0

NOTE: If cube is ending in 2, 3, 7, 8 then cube root ends in there tens complement i.e., that number subtracted from 10. For rest of the numbers cube root ends in same number as the cube ends in.

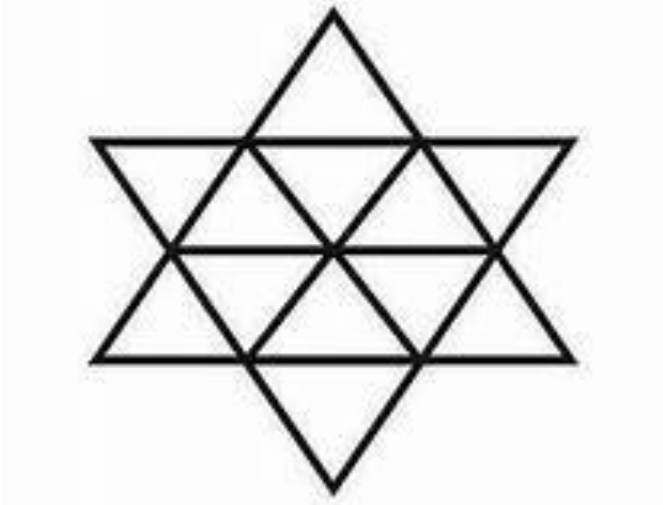
Example: Let's find cube root of 493039.

STEP 1: Divide the number in groups of 3 digits each, starting from right side. It will be 493 039. Since there are two groups, therefore the cube root will contain only 2 digits.

STEP 2: Left digit is found from left group. We have to see that left group i.e., 493 lies between cubes of which two numbers (from table 1). It lies between cubes of 7 and 8. Smaller of these two will be the left digit. So, left digit of cube root will be 7.

STEP 3: Right digit is found from the right group. This group ends in 9, so its cube root will also end in 9 (from table 2) and hence right digit of cube root will be 9. Hence required cube root will be 79.

PUZZLE 1: How many triangles are there in the following figure?



PUZZLE 2: Three naughty boys stole some mangoes from a garden. As it was late in the evening, they decided to divide the mangoes equally among them in the morning and went to sleep.

At night while the other two were sleeping, one boy woke up and ate one mango. From the remainder he took one third and went to sleep.

After some time second boy woke up. He also ate one mango and from the remainder he took exact one third and went back to sleep.

A little before sun rise the third boy also woke up, ate one mango and like other two boys he also took exact one third of remaining mangoes.

In the morning, all the three boys went together to the basket of mangoes, counted them. They found one rotten mango and threw it away. From the remainder they made an exact division.

How many mangoes in all did they steal?

ANSWERS

SCIENTIST: HOMI JAHANGIR BHABHA.

PUZZLE 1 : 20 TRIANGLES

PUZZLE 2 : 79 MANGOES

*********HOPE YOU ENJOYED*********