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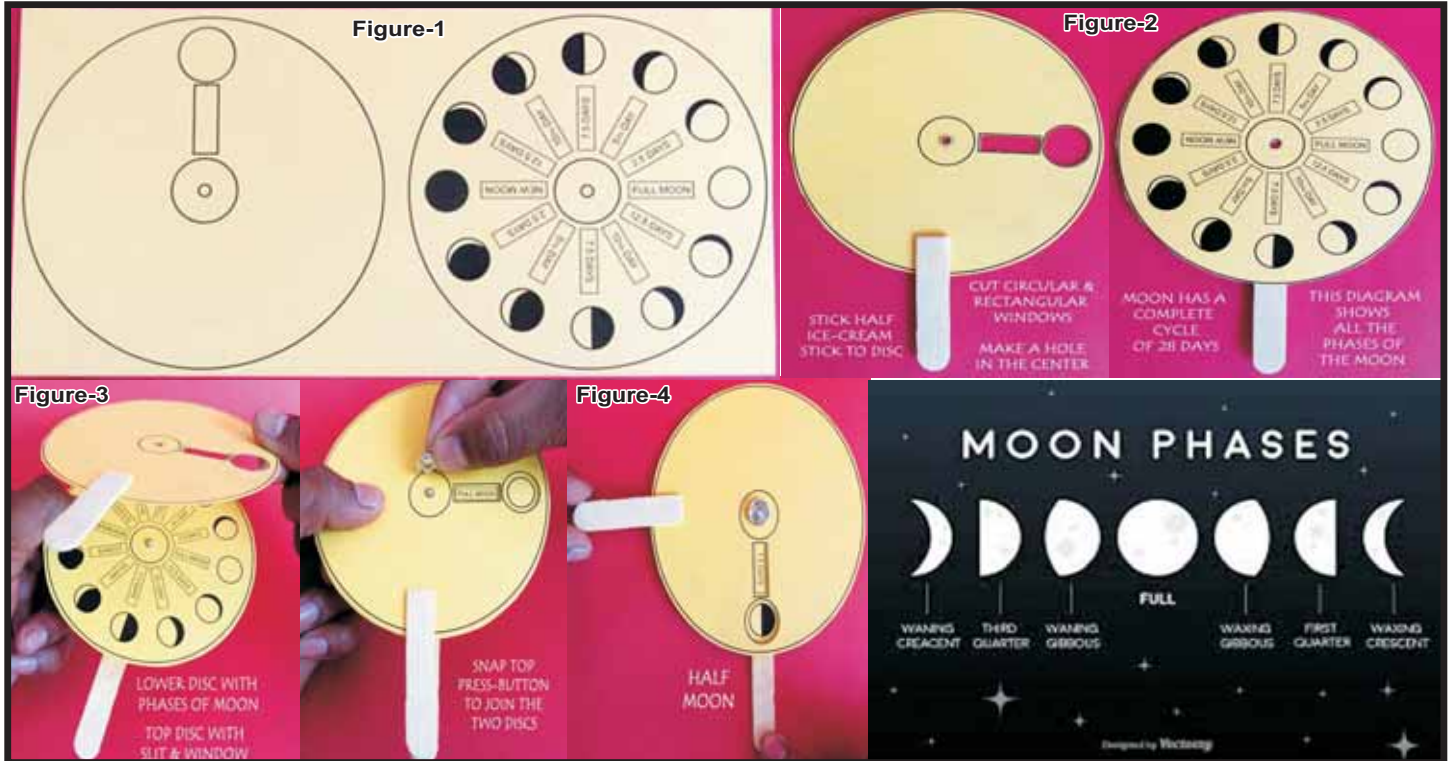
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Jr. Scientist

Phases of Moon



Materials required: scissors, pencil, compass, glue, press button, chart-sheet, ice-cream stick.

1. According to fig.1, draw 2-circles of radius 7cm on a chart-sheet with the help of compass. Draw a circle on the circumference of 1st circle, with the help of 1 rupee's coin & beside it draws a rectangle of 1cm width & 3cm length (as shown in fig.1). On the 2nd circle of fig.1, draw 12 circles on the circumference of the circle with the help of 1 rupee's coin & also draw phases of moon & write day also.
2. Using a cutter, cut the circle and rectangle on the card-sheet as shown in Figure-2. Now that rectangle and circle will act like a window here. Also make two halves of ice-cream stick, one part of which will fixed on the circle of disk window at the top. And the other part fixed at the bottom of the disc on which phases of moon are drawn. Drill a hole in the centre of both discs.
3. According to fig.3, join both discs with the help of press button.
4. According to the fig.4, your model showing phases of moon is ready. with the help of turning ice-cream stick, you can show & explain 'Phases of moon' to your friends & can ask questions about it.

Send us questions that you asked & Answers of your friends.





GoodFood

Eat Rayan to stay young ...



In the scorching heat of summer vacation, sitting in the shade of Rayan, weaving and eating Rayan has been snatched away from children in modern times. Still in rural life children are seen losing such fun. In the present scenario, urban children are less familiar with Rayan, so let us get a broad introduction of Rayan's features and its benefits.

Ryan is commonly found in India, Sri Lanka, China and Bangladesh. Rayan is a tree, commonly found in tropical forests and deciduous forests. It is a deciduous tree with a height of 3 to 12 meters and is made up of crooked branches. Its lifespan has been seen to be more than 500 years. Rayan is a fruit plant of Sepotaceae, whose scientific name is *Manilkara hexandra*. In India, the tree is found in Gujarat, Uttar Pradesh, Madhya Pradesh, Bihar, Chhattisgarh, Maharashtra and Tamil Nadu. Let's see its identity ... Rayan, Khirti in Gujarati; Khirni, Drirh, Khiri khirni in Hindi; Bakula in

Kannada; Raanjan in Konkan; Karni, Kshirni, Rajan, Rayan, Rayani in Marathi; Kshirni, Nimbabij, Rajadana in Sanskrit.

On breaking the fruit and leaves of rayan gives a milky secretion, that is why it is called "Kshirni" in Sanskrit from the word Kshir. In your ancient books, Rayan has been identified as the "King of Fruits" due to its medicinal value. Since it is used for kings, it is known as Rajphal or Rajdan.

Generally, fruits are found in rayan trees

after 3 years. But more fruits are seen after seven years. Small, fragrant, white flowers bloom in between September to December. The fruits are ripe and edible during April to June. Rayan fruit is small, yellow, sweet, filled with milk, oval (like neem fruit), soft & sticky. It can be

used for a long time by drying. While oil obtained from its seeds is used to cook food. Rayan fruits and seeds are rich in protein, fat, water as well as minerals like iron, Calcium, Selenium, Copper. Seed oil

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Nano news

Robotics & Nano technology

Robotic Police Dog

Robotics has advanced a great deal in recent times; there are plenty of creative innovations



combining AI and robotics. One such innovation is Spot, a robotic dog, which has been invented by Boston Dynamics. In recent events, Spot has been lent to Massachusetts State Police for a 90 day trial period to explore its working on the field. Spot is meant to function in hazardous situation like bombs or dangerous suspects so that police lives are safe. With four legs, a long arm for a head and a 360 degree camera, this metal dog can be useful if used correctly.

Office napping?

Offices can be really stressful on a hectic day; there is work and you just want a 15 minute rest. But where to rest comfortably? To solve such problems, a new invention 'Under Desk Hammock' manufactured by Uplift Desk, is now available; it is just as it sounds, a hammock which can be tied under desk. It can be attached to the



brand's standing desk which provides a sling for comfortable hanging. All one needs to do is clip the hammock on the brand's desk (UPLIFT V2) frame using included carabiners and you are ready to nap away peacefully. Sounds quite comfy, doesn't it?

Mini Tyre Inflator

Norshire Mini is the world's smallest and most portable tyre inflator. It comes in



three versions: battery less, with a battery & a Power Version. The battery less version is sleek, cylindrical shaped device with inbuilt OLED display and capacitive touch. It is built so compact that it can fit inside glove compartment of a car or inside your back pack. It can be used for inflating a car tyre, a bike or even bicycle tyres. Power version can produce pressure as high as 174 psi. It is quite safe and easy to use.

Safety Key during Corona Crisis

In Australia, a TAMILIAN, Muthu Vellayappan, a Ph.D student at Monash University has come up with an innovative 3-D printed key which can be used for opening door handles, lift buttons, ATM machines or even to do a toilet flush. This key was



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Alchemist

Hello readers,

We know that carbon was amongst the first elements which were formed during creation of universe. It is therefore not uncommon that we find multiple compounds of carbon available abundant in nature. One such chemical compound is Calcium Carbonate (CaCO_3). It is found naturally in limestone rocks in the form of minerals namely calcite and aragonite and also present in shells of marine organisms like bryozoans and molluscs, snails and eggs. Chalk, limestone and marble are some of the commonly used calcium

Facets of Calcium Carbonate

carbonate products in day-to-day life.

Calcium carbonate is a versatile substance which finds tremendous usage in many industries. It finds uses in the construction industry, for road building, purification of iron ore, in agriculture for neutralising acidic soil and the list goes on. Some common forms of calcium carbonate and their uses have been listed out below.

Limestone: Limestone is a rock which is made up of minerals calcite and aragonite which are different forms of calcium carbonate. Sea shells and bones of dead marine animals settle on the bottom of the ocean which is converted to

limestone in a million years. In Gujarat, certain parts of Saurashtra, Lakhpat, Kheda and Banaskantha produce good quality of limestone. Depending on the source and impurities (oxides of aluminium, iron and magnesium, sand) present, limestone can vary in colour from white to grey. One of the oldest and widely used applications of limestone is for the production of 'Quicklime'. When limestone is heated at about 1000°C in a kiln, it releases a carbon dioxide gas and forms carbon oxide (CaO) which is known as 'quicklime'.



Aragonite



Chalk



Calcite



Limestone



Marble

This process is known as calcination. A mixture of quicklime, sand and water gives mortar which finds applications in construction for binding rocks or stones. Quicklime finds application in manufacture of cement, paper, high-grade steel, caustic soda and soda ash.

Calcite: It is one of the most common minerals on Earth; it constitutes of about 4% of Earth's crust. It is generally white in colour but it can also have light shades of yellow, orange, blue or pink. Impure form of



calcite contains oxides and impurities of magnesium, manganese and zinc. It finds applications in multiple industries; it is used as filler material in paper, plastic and rubber production and for making glass for optical instruments.

Marble: Limestone when subjected to high temperature and pressure crystallises and forms a metamorphic rock, marble. The beauty of the white marble is brought out when the rock is polished thoroughly. Depending on the mineral composition present in marble (such as quartz,

graphite, pyrite and iron oxide), its colour can vary to give a pink, brown, grey or green marble. Marble mainly finds uses in construction for decorative building materials and for making sculptures. Makrana marble is one of the purest and whitest forms of marble available in India which is believed to have been used in construction of the Taj Mahal and Victoria Memorial. Marble dust is used as an additive in cement and also finds uses in soap making.

Chalk: Chalk is a naturally occurring mineral. It is a soft, white, porous sedimentary rock which is made up of mineral calcite. One of the most common uses of chalk is for writing on blackboard. Chalk is also used for producing quicklime and slaked lime. Due to its basic property, it is used for neutralising acidic soil and raising pH of the soil. In the field of medicine, small quantity of chalk is used as an antacid. It can also be used for cleaning and polishing. In toothpaste, there is a small quantity of chalk present which acts as an abrasive. It also finds application in cementing industry.

Whiting powder: Whiting powder can be prepared by finely grounding calcium carbonate prepared from chalk, marble or limestone. It is slightly abrasive in nature. It finds applications mainly as a filler pigment to increase coverage of paints, coating and whitewash. Whiting powder when mixed with 15% of linseed oil gives putty. Putty is mainly used in construction as a primary coating to give a smooth finish to the walls and to increase the durability of paint.





Jr.Kalam

India against COVID-19

Corona virus has taken the world by storm; every nation is inventing new strategies to deal with the crisis. India is using its various brilliant minds in the fight; various Indian institutes have come up with innovative and effective technologies which can help tremendously in the fight against Corona.

One of the approaches suggested is using UV disinfection technologies. Based on the current data available, the International Ultraviolet Association (IUVA) believes that UV disinfection methods can be an effective barrier in reducing the transmission of COVID-19 virus. UV is very popular as a disinfectant for air and water and if applied correctly, it can diminish the risk of getting affected by corona from contaminated surfaces. Based on the guidance from leading experts all over the world, IUVA believes that UV disinfection method would be an effective method against this virus. Here, UV-C/UV/UV disinfectant refers to UV-C light energy which has a wavelength of 200-280 nm in germicidal range and is not the same as UV-A or UV-B which is obtained in tanning beds or sunlight exposure.

Since 40 years, UV-C light has been used extensively in disinfecting water, waste water, air, pharmaceutical products and pathogen contaminated surfaces. The

COVID-19 virus has been discovered to live on plastic and steel surfaces for up to 3 days. Hence, minimizing the risk of transmission from contaminated surface to person is the key. Normal cleansing and disinfectants can leave some residual contamination which can be completely removed by UV-C. UV-C with wavelength 254 nm has been known to achieve high level inactivation of near relative of COVID-19's virus like SARS-CoV-1 and MERS-CoV.

Based on this technology, IIT Guwahati has come up with a low-cost UV-C LED-based disinfection system that can sanitise infected surfaces with a 400 J dose of UV radiation within a span of 30 seconds. This system is designed to provide a uniform exposure even to non-porous surfaces like flat, tiled floors.

Apart from this, various other science & technology institutes have come up with innovations which are in different phases of manufacturing. We have listed out a few approaches which are soon to hit the market.

(1) UV Blaster

The UV blaster is a disinfection tower developed by Laser Science & Technology Centre, a Delhi-based laboratory of DRDO (Defense

