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Dr. Sandesh Pandurang Jagadale
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Phone- 02358 283256

3. Name & Address of Principal:
Principal Dr. S. P. Jagadale
Dapoli Urban Bank Senior Science College, Dapoli
Dist. Ratnagiri -415712
Phone- 02358 283256

I, Shri Dr. S. P. Jagadale hereby declared that the particulars given above are true to the best of my knowledge and belief.

Sign /-
(Dr. S.P. Jagadale, Principal)
(The editor and publisher may not agree with the views expressed in articles.)

Ethno medicinal Uses

Botanical Name : *Drynaria quercifolia* (L.) J. Sm.

Common Name : Bashing, Wanar bashing, Pankadha, Fansawarche Bandgul.

Family : Polypodiaceae

Drynaria quercifolia (L.) J. Sm.

Ethno medicinal Observations -

1. Fronds are used for politicking against swellings.
2. Fronds are used on anti AIDS (Used on HIV virus).
3. Leaf extract used on ears pulse.
4. Young fronds are used as cattle fodder in some part of study area.
5. 50 gm rhizome mixed to meat curry (1/2 liter) and consumes 7 to 8 days, then sever Pile will cover within a eight days.
6. The rhizome and leaves decoction is used as anthelmintic and expectorant.
7. The whole plant juice used in low fever.

Other uses -

It is cultivated as ornamentals in gardens as epiphytes. It is also grown in pots, hanging baskets for indoor gardening.

Field observation

Common on tree trunk, found throughout the District.

Reference-

Vikram P. Masal (2011), Ethno medicinal and phytochemical studies of some Pteridohytes of Ratnagiri District of Maharashtra (INDIA) Ph.D. Thesis Shivaji University Kolhapur.

Article by
Dr. Vikram Masal
Department of Botany

Endlessly recyclable materials could fix our plastic waste crisis

One thing chemists do superbly is make bonds between atoms. We are now wading through the consequences of that success: plastic waste that ends up burned, landfilled or floating in the oceans. Plastics are polymers, long chains of molecules linked by strong chemical bonds. This is why they can be hard to degrade or recycle. Snipping apart those chemical bonds, to return to the small molecular building blocks, is often a tricky chemical problem.

There has been varying success in dealing with the main plastics we use. The low-hanging fruit is polyethylene terephthalate (PET), which is used to make plastic bottles. It can simply be shredded and remoulded into fresh bottles. No chemists need apply.

It is a different story with most other important plastics. Take polyvinyl chloride (PVC), which is ubiquitous in double-glazed windows and plenty besides. "PVC's an absolute nightmare," says chemist Anthony Ryan at the University of Sheffield, UK. There is no known way to recycle it, and even if you did, you would end up with vinyl chloride, a toxic compound that can increase the risk of cancer.

One job for chemists, then, is to devise new reactions that can break plastics into molecules that can be reused. Susannah Scott at the University of California, Santa Barbara, has recently had success doing this with polyolefins, a class of plastic that includes polyethylene. She developed a technique that uses a catalyst to break down these plastics into smaller molecules without having to use bucketloads of heat. These smaller molecules could be used in detergents, paints or pharmaceuticals.

We also need to design new plastics and plan from the start what will happen to them after they come to the end of their life. Chemists are starting to invent plastics that can be recycled infinitely or that break down into materials that nourish the soil.

One example is the plastic devised by Ting Xu at the University of California, Berkeley. Xu added tiny enzyme-containing capsules to the plastic. The material can be processed, heated and stretched into useful objects. But when its life is over, all you need do is soak the stuff in lukewarm water for a week or so. This releases the enzymes, which digest the plastic into small molecules. We will need plenty of new materials like this if we truly want to eliminate the scourge of plastic waste**.**

Article by
Miss. Pooja Potkar
Department of Chemistry

Role of Women Entrepreneurship in Social Development

Introduction

The population of the world is made up primarily of women. However, they are the greatest group that is given the advantages of development. In India, women's employment rates are fewer than half those of men. There is a widespread belief that men are the family caregivers and that most of the work women do is either done in their own time or is done to bring in money to support the family.

Entrepreneurship and Women

Women's economic independence and social standing can both be improved through entrepreneurship. Women's entrepreneurship is growing, which helps society recognise and value their skills. It raises their standing and encourages the inclusion of women in economic and national growth.

Role of Women Entrepreneurship in Social Development

Women entrepreneurship in social development engaged in various way such as .Contribution in Economic Development, Problem of Unemployment, Eradication of the social evils, Self-dependence, Development of leadership etc.

Difficulties in the Development of Women Entrepreneurship

In India, female entrepreneurs face numerous challenges. Women who run large businesses are quite rare. The majority of their work is in small-scale industries. They experience numerous difficulties starting and operating their businesses, and the majority of these issues are related to management and finance. Such as social attitude, lack of education, low mobility, family ties, intense competition, problem of finance, gender difference.

Strategy of Development of Women Entrepreneurship:-

Some psychological and sociological modifications must be made in the system to encourage women to shed their conventional views of themselves and their roles in society.

Women must work more to influence people's attitudes and advance their status in society at large.

Women must be encouraged to act appropriately and at the appropriate moment.

To ensure the smooth operation of their industries, all female business owners should come together and develop cooperative societies.

Women should be made aware of the several financing options, financial incentives, and subsidies available.

Suggestion for the Development of Women Entrepreneurship

Governments at all levels should support women business owners in attending international trade shows, exhibitions, and conferences.

The family of a woman entrepreneur should actively participate and provide all necessary assistance in matters pertaining to managing businesses founded by women entrepreneurs.

Every educated woman has a moral obligation to assist every female business owner they come across in their daily lives, whether she works in a salon, a tailor shop, etc.

Conclusion

Women are now seeking meaningful engagement in a variety of professions as a result of industrialization, urbanisation, globalisation, and educational advancement, and they are becoming more conscious of the value of entrepreneurship.

References

- Raheem,A.Abdul and C. Prabhu Women entrepreneurs: Problems and Prospects. India: Economic empowerment of women. New Century Publications, New Delhi, India-2007.
- Akhauri, MN.M.P and S.P. Mishra, "Entrepreneurship education, a concept of approach and methodology", Indian Management.

Article by

Assist. Prof. Shraddha D. Khupate

Department of Commerce

Open-Source Software

Open-source software (OSS) is software that is distributed with its source code, making it available for use, modification, and distribution with its original rights. Source code is the part of software that most computer users don't ever see; it's the code computer programmers manipulate to control how a program or application behaves. Programmers who have access to source code can change a program by adding to it, changing it, or fixing parts of it that aren't working properly. OSS typically includes a license that allows programmers to modify the software to best fit their needs and control how the software can be distributed.

What is the history of OSS?

The idea of making source code freely available originated in 1983 from an ideological movement informally founded by Richard Stallman, a programmer at MIT. Stallman believed that software should be accessible to programmers so they could modify it as they wished, with the goal of understanding it, learning about it, and improving it. Stallman began releasing free code under his own license, called the GNU Public License. This new approach and ideology surrounding software creation took hold and eventually led to the formation of the Open-Source Initiative in 19.

What is the Open-Source Initiative?

The Open-Source Initiative (OSI) was created to promote and protect open-source software and communities In short, the OSI acts as a central informational and governing repository of open source software. It provides rules and guidelines for how to use and interact with OSS, as well as providing code licensing information, support, definitions, and general community collaboration to help make the use and treatment of open source understandable and ethical.

How does OSS work?

Open-source code is usually stored in a public repository and shared publicly. Anyone can access the repository to use the code independently or contribute improvements to the design and functionality of the overall project.
OSS usually comes with a distribution license. This license includes terms that define how developers can use, study, modify, and most importantly, distribute the software. According to the Synopsys Black Duck® Knowledge Base, five of the most popular licenses are:

- MIT License
- GNU General Public License (GPL) 2.0—this is more restrictive and requires that copies of modified code are made available for public use
- Apache License 2.0

- GNU General Public License (GPL) 3.0
- BSD License 2.0 (3-clause, New or Revised)—this is less restrictive

When source code is changed, OSS must include what was altered as well as the methods involved. Depending on the license terms, the software resulting from these modifications may or may not be required to be made available for free.

What are some examples of OSS?

- GNU/Linux
- Mozilla Firefox
- VLC media player
- SugarCRM
- GIMP
- VNC
- Apache web server
- LibreOffice
- jQuery

Advantages of open-source software

- Open-source software is free.
- Open source is flexible; developers can examine how the code works and freely make changes to dysfunctional or problematic aspects of the application to better fit their unique needs.
- Open source is stable; the source code is publicly distributed, so users can depend on it for their long-term projects since they know that the code's creators cannot simply discontinue the project or let it fall into disrepair.
- Open-source fosters ingenuity; programmers can use pre-existing code to improve the software and even come up with their own innovations.

Reference:
https://www.synopsys.com/glossary/what-is-open-source-software.html

Article by -
Prof. Shravya Pawar
Department of Computer Science

The Negative Impact of LEDs on the Environment and Health

Artificial light disturbs the natural light/dark cycle of the world. Animals and plants evolved over millennia, responding to the natural daily transition from dark to light and back to dark again. As a result, humans and plants have developed circadian rhythms that are in tune with this cycle. Introducing light during the night disturbs the evolved life-sustaining behaviors of animals, such as reproduction, nourishment, sleep, and protection from predators. Studies have shown that light pollution negatively impacts bats, birds, insects, reptiles, amphibians, mammals, and plants. In the darkness, the mammalian pineal gland is prompted to produce melatonin, the hormone that regulates the sleep-wake cycle, helping us transition from wakefulness to sleep. Artificial light disturbs melatonin production, with LEDs being a particularly harmful disrupter. Melatonin plays a vital role in disease, particularly in cancer. Studies suggest that disruption to melatonin production may allow cancer to develop, and further studies have shown that reduced melatonin levels may allow cancer to grow.

LEDs' role on the environment and health must be fully understood to prevent these negative effects. For example, employees who work night shifts are likely to face long-term exposure to LEDs in the hours of darkness. This may increase their risk of sleep disorders and cancer via disruption to melatonin production. Further research will likely develop our understanding of these relationships, allowing us to implement effective preventative strategies.

References

https://www.azocleantech.com/article.aspx?ArticleID=1616

Article by -

Mr. Aniruddha Sutar

Department of Environment Science

Escherichia coli (E. coli)
Common Microbiota Lives In The Intestines

Introduction

E. coli normally lives in your intestines. Most strains are usually harmless. A few strains cause diarrhea/bloody diarrhea, vomiting and stomach pains and cramps. One strain can lead to kidney failure if not properly managed. Eating contaminated food is the most common way to get an E. coli infection. Most people recover within a week without medications.

What is E. coli?

Escherichia coli (E. coli) is a bacteria that normally lives in the intestines of both healthy people and animals. In most cases, this bacteria is harmless. It helps digest the food you eat. However, certain strains of E. coli can cause symptoms including diarrhea, stomach pain and cramps and low-grade fever. Some E. coli infections can be dangerous.

What does E. coli look like?

E. coli is a rod-shaped bacterium of the Enterobacteriaceae family. It can live in environments with or without air. These bacteria live in the intestines of healthy people and warm-blooded animals.

What causes an E. coli infection?

Technically, you develop an E. coli infection by ingesting (taking in by mouth) certain strains of E. coli bacteria. The bacteria travel down your digestive tract, releases a destructive toxin, called the Shiga toxin, which damages the lining of your small intestine. The growing infection causes your symptoms.

How did I get infected with E. coli?

You come into contact and swallow E. coli by eating contaminated food, drinking Contaminated water or by touching your mouth with your hands that are contaminated with E. coli bacteria,Contaminated foods-Meats,Unpasteurized (raw) milk,Unpasteurized apple cider and other unpasteurized juices,Soft cheeses made from raw milk,Fruits and veggies,Contaminated water, Contaminated hands.

References-

1.Centers for Disease Control and Prevention. E.coli (Escherichia coli). (https://www.cdc.gov/ecoli/index.html) Accessed 9/14/2020.

2.U.S. Department of Health & Human Services. E. coli. (https://www.foodsafety.gov/poisoning/causes/bacteriaviruses/ecoli/) Accessed 9/14/2020.

Article by:

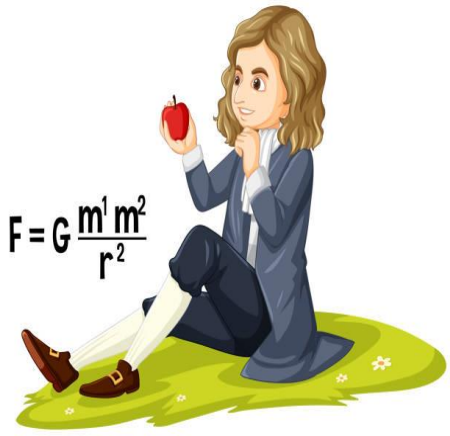
Miss. Priyanka Salvi

HOD, Department of Microbiology

Newton's Discovery of Gravitation

A popular story says that in 1665-1666 Newton came up with the theory of gravity instantly, when an apple fell from a tree and hit him on the head. Actually, Newton saw an apple falling from a tree, and it got him to thinking about the mysterious force that pulls objects to the ground. He compared the straight path of the apple to the curved path of a fired cannonball. He wondered what would happen if the cannonball went faster and faster, and realized it would eventually "fall" around the curve of the Earth forever and never hit the ground. This "forever falling" motion describes the movement of the Moon around the Earth, and the Earth around the Sun.

Newton's law of gravitation, statement that any particle of matter in the universe attracts any other with a force varying directly as the product of the masses and inversely as the square of the distance between them.



The importance of gravity:

- Gravity pulls falling objects to the ground, but people already knew intuitively that something like that was going on.
- The really groundbreaking thing about the law of gravity was that it applied to objects of all sizes, stating that the more mass an object had, the more it attracted other objects.
- At the time of Newton's discovery, people didn't have much of an idea of how the orbits of moons and planets worked.
- The new discovery explained a lot about that, in particular why orbiting objects don't just fly off into space.

Center Of Gravity

One way to look at gravity is to look at it as a force that pulls things downward more precisely towards the centre of the Earth. But it doesn't always work like that! Sometimes gravity causes things to topple and turn over, especially if they are high up and unbalanced. No one understands this better than tightrope walkers. While tiptoeing on the high wire, they often wobble from side to side to entertain us, yet they hardly ever fall. Instinctively they understand the physics of forces and manage to stay firmly on the rope. If you, like them, understand a simple concept known as the centre of gravity, you consider balancing a child's play.

What is the Centre of Gravity?

The Centre of gravity is a theoretical point in the body where the body's total weight is thought to be concentrated. It is important to know the centre of gravity because it predicts the behaviour of a moving body when acted on by gravity. It is also useful in designing static structures such as buildings and bridges.

In a uniform gravitational field, the centre of gravity is identical to the centre of mass. Yet, the two points do not always coincide. For the Moon, the centre of mass is very close to its geometric centre. However, its centre of gravity is slightly towards the Earth due to the stronger gravitational force on the Moon's near side.

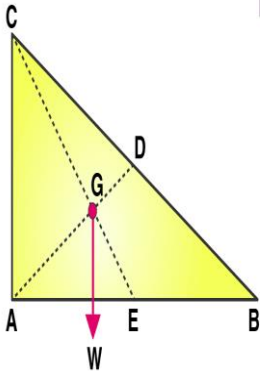
In a symmetrically shaped object formed of homogenous material, the centre of gravity may match the body's geometric centre. However, an asymmetrical object composed of various materials with different masses is likely to have its centre of gravity located at some distance away from its geometric centre. In hollow bodies or irregularly shaped bodies, the centre of gravity lies at a point external to the physical material.

Determining the Centre of Gravity for Symmetrical Bodies

For simple shaped object, the centre of gravity can be determined by the following ways:

1. When we balance an object with the help of a string or an edge, the point at which the object balances is the centre of gravity.
2. Another simple physical procedure employed to determine the centre of gravity is as follows:

Suspending the plate given in the figure by attaching a cord to point A and then by attaching the cord at point C, the centre of gravity of the plate can be located.



The line AD is vertical when the plate is suspended from A; likewise, the line CE is vertical when suspended from C. The centre of gravity of the plate lies at the intersection of AD and CE. When an object is suspended from any single point, its centre of gravity lies directly beneath that point.

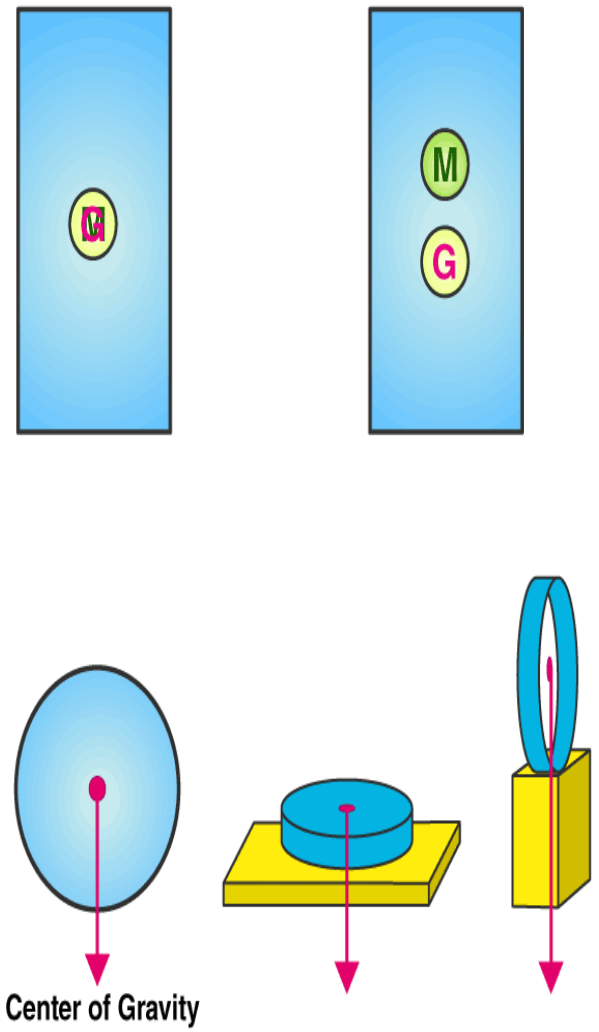
Difference between Centre of Mass and Centre of Gravity

It is common to assume the centre of mass and the centre of gravity to be the same, but this is not the case.

The centre of mass is a point at which mass distribution is equal in all directions, and it doesn't depend upon the gravitational field. The centre of gravity is a point in an object where the distribution of weight is equal in all directions, and it does depend on the gravitational field.

However, an object's centre of mass and centre of gravity lies at the same point in a uniform gravitational field.

In the above figure, the object on the left is in a uniform gravitational field and has an overlapping centre of gravity and mass. For the object on the right, the gravitational field is stronger towards its base, and the centre of gravity is below the centre of mass.



How can a ring be balanced if its centre of gravity lies outside?

The centre of gravity of a uniform circular ring does not lie in its centre but at its geometric centre. Although it lies outside the mass, the centre of gravity of a circular ring balances itself when placed on another object, as shown in the figure. The gravitational force acts through the supporting object.

Article by:
Prof. D.D. Kulkarni
HOD, Department of Physics

Bullet Ant (Paraponera clavata)

Kingdom : Animalia

Phylum : Arthropoda

Class : Insecta

Order : Hymenoptera

Family : Formicidae

Genus : Paraponera

Species : Clavata

Information:

The **Bullet Ant** (*Paraponera clavata*) is an ant species found in lowland tropical rainforests in Central and South America. They are famous for having the **most painful sting in the world** which is said to be comparable to the pain of being shot, giving them their name. They are sometimes called the 'big black ant', 'conga ant'. They are members of the order **Hymenoptera**, to which most ants, wasps and bees belong.

Bullet Ants are famous for their sting, and are one of the world largest ants, with distinctive mandibles (pincers) and a large stinger extending from their abdomen. Like many members of the order Hymenoptera, they live in complex colonies with hundreds of members. They have lots of forager ants who collect food and bring it back to the nest which is where the queen ant and her larvae live.

Their nests are often at the base of trees with buttress roots. Worker ants will climb up and down trees searching both for small arthropods, and for nests they can raid for nectar. They attack small arthropods with their sting, the venom of which paralyses or kills them. Whatever goodies they find they carry back to the nest in their large mandibles. As with many invertebrates in the tropics, there is not enough data to know the conservation status of Bullet Ants. However, their habitat is under threat, meaning they are likely also threatened.

Bullet Ants Have A Powerful Venom

The toxin in their venom is called poneratoxin. It works by altering the normal function of synapses (communication points in the nervous system) in both vertebrates and invertebrates. It makes the synapses go into overdrive, sending lots of signals to the brain, which is what causes pain. The venom is so potent that it is being researched for its potential as a natural pesticide.

Reference:

https://factanimal.com/bullet-ant/

Article by
Mr. Sujit Ramesh Temkar
Department Zoology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Mumbai, 26th January, 2018