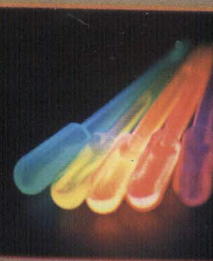




**REGIONAL SCIENCE CITY**  
(National Council of Science Museums)  
Ministry of Culture, Government of India  
Aliganj Extension, Sector-E (Ekta Vihar)  
Lucknow-226024



**WONDER WORLD  
OF MATERIALS**  
A GALLERY ON EVERYDAY STUFF



predominant use has given way, at a later time, to a more advanced material. In fact eight major metals of early antiquity used through Stone to Bronze Age are: Gold, Silver, Copper, Mercury, Tin, Lead, Zinc and Iron.

One of the most recognizable alloy worldwide which touches everyone's life is the Steel- an alloy of Iron and Carbon. Depending on the amount (%) of carbon present in the steel, also called plain carbon steel, it can have varying properties for various uses. Increasing the carbon content increases the hardness and strength of plain carbon steel. With an interactive exhibit, a visitor can make his own steel.

The section on designing molecules uncovers various facets of polymer world and provides answers to questions like what polymers are made of. From natural to synthetic bounty, one can unravel the time line of polymers. One can also explore how composites, ceramics and semiconductors have impacted our life style.

The section on Nanomaterials takes you on a journey to the Nanoworld, which is a bridge between the world we live in and the world of atoms where unexpected



things happen. Interactive multimedia and displays in the section will tickle the minds of young and adults to find out how the materials behave at nano level and what their application in day to day life will be.

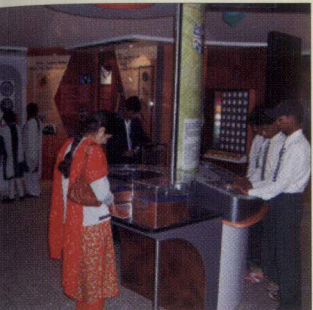
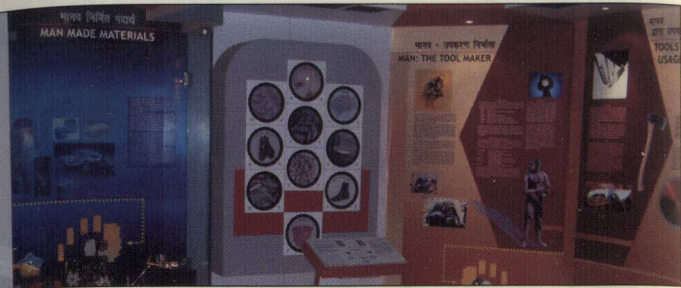
The section on the STRANGE MATERIALS gives you a glimpse of some exotic materials such as tough, wear resistant ceramics, liquid-crystals, carbon-reinforced ceramics, shape memory alloys, aerogels, liquid magnets, and biomaterials which are only a few of the advanced and truly strange materials. Chemists working with the structure of matter are constantly developing new ones.

The gallery concludes with a concern that the materials waste like plastic wastes, E-wastes etc can create for the



environment and human health. New materials technologies developed through engineering and science will continue to make startling changes in our lives in the 21st century. The future will bring ever-increasing challenges and opportunities for new materials and better processing. Materials are evolving faster today than at any time in history. Materials science will therefore be one of the fields of the careers with excellent future opportunities for the students.





The exhibition portrays different fascinating aspects of Material Science namely: fundamentals of material science, polymers and plastics, electronic materials, semiconductors and superconducting materials, sensors, world nanotechnology, structural materials, industrial materials, nanotics, surface and cold chemistry, explosive materials, functional materials etc. It also showcases how the material science has progressed over the years from ancient era to modern times.

It addresses issues like what are natural and manmade materials and how they are classified. Such is the fascinating story of materials that ages ago it was discovered that clay could be fired to make pots and this discovery was revolutionary; so was the more recent discovery that clay also contains the substance that runs our computers. One can, not only explore why we needed variety of materials we use everyday but also the strange world of modern wonder materials as the exhibition shall provide a glimpse of where the future of materials research might take us.



Throughout history, man has used a wide variety of materials to make things. If analyzed scientifically, one can see patterns of change in these things and so also in the materials that make things. These changes have occurred mainly due to: changing resources, discovery of new sources of raw materials or new processes for them, invention of new industrial or manufacturing process, discovery of novel materials, a combination of materials and changing tastes and fashions.



The quiz on the Natural & Manmade materials provide information on different kinds of material we use in our day to day life. Materials can be natural-like wood, or man made-like plastic. There are now over 300,000 different known materials in existence. On going research in material science has resulted in replacing old materials and substances with new ones.

One can find what basic properties of the materials are from the physical qualities of a material like: density (what we usually call weight), texture, hardness, elasticity, colour, tone (sound),



reflectivity & opacity (light, conductivity- heat & light), absorbency, strength, toughness, ductility, taste, smell, brittleness and many others. Man's first observance of the material has always been the most fundamental and important basis for judging a material. One of the exhibits provides an opportunity for the visitor to scratch different materials to get a feel of hardness. In another exhibit no matter what effort the visitors make, they can't create wrinkles in the wrinkle free cloth, which can be compressed very hard yet it remains wrinkle free.

Tinkering with materials has been an ongoing activity of human kind from antiquity. Ancient people exploited what they could find around them: wood, stone & clay as they were

scattered all around. Recognition and experimentation with metals started within the past eight to nine thousand years only.

Once discovered, metals started displacing earlier materials only because of their properties specially responses to applied loads. It is intriguing to observe that just as man has evolved through the Darwinian process of biological evolution with the survival of the fittest, materials too have gone through a process of evolution, inanimate though they are. At different periods of history one set of materials in



# WORLD OF MATERIALS

We live in a world that is both dependent upon and limited by materials. Everything we see and use is made of materials: cars, airplanes, computers, refrigerator, microwave ovens, TVs, dishes, silverware, athletic equipments, and even biomedical devices. In fact, everything found everywhere in the Universe from the farthest star to the smallest speck of dust – is made up of matter in an incredible variety of forms. Materials Science and Engineering, has therefore become an important field of study, which encompasses the spectrum of material types and how to use them.



Materials span the range: metals, ceramics, polymers (plastics), semiconductors, and combinations of materials called composites. Understanding how different materials and other stuff is put together, how it can be used, how it can be modified and made to do more amazing things—even creating completely new kinds of stuff – is what this gallery will address using visually rich illustrations, models, computer multimedia and interactive exhibits.

