# SUMMER SCIENCE CAMP 2005

## (9.5 2005 TO 14.5.2005)

## A REPORT

Dr. P.R.Lalitha
Convener, Exploratory Laboratory
&
Coordinator, Summer Science Camp

**REGIONAL INSTITUTE OF EDUCATION**
**[National Council of Educational Research and Training]**
**Mysore 570 006**

**May 2005**

# FOREWORD

Science and its application as technology plays a dominant role in shaping the destiny of a nation. Any program in science education should promote and enhance scientific and creative skills. Learning of Science should be made enjoyable and children should see the relevance of what they learn in science classrooms in their daily life. The need of the day is hence a paradigm shift from transmissive instruction to constructivist instruction. This calls for an instruction which gives priority to the child and what he brings to the class as a result of his interaction with the environment in which he is placed. A child needs to enjoy learning science and, "learn how to learn". To this end, Summer Science Camps go a long way in creating in children the enthusiasm to know more and equip them to perform to the best of their abilities, while keeping themselves abreast of the advancements in Science and Technology.

A Summer Science Camp was organized as a part of the Exploratory Laboratory Activities from 9$^{th}$ May to 14$^{th}$ May, 2005 for students of DMS , Mysore and three of our cooperating schools in Mysore. The sole objective of the camp was to communicate to them the excitement of doing science while taking care to see that their curiosity is enhanced. A special feature of this years camp was to make children aware of the natural calamities that occur like the Tsunami and how to protect themselves in the event of such a calamity resurfacing. In addition the importance of using vermicompost instead of chemical fertilizers was dealt with by taking the children to a farm.

This report contains the details of the activities conducted during the camp. I would like to place on record my appreciation for the efforts put in by Dr.P.R.Lalitha, Reader in Physics and Convener, Exploratory Laboratory, and her team members, Dr.G.R.Prakash, Reader in Chemistry, Dr. S.P.Kulkarni, Sr. Lecturer in Botany and Mrs. B.P.Veenakshi, TGT, DMS, Mysore for sparing no efforts in organizing the Summer Science Camp and carrying it through to completion.

**G.Ravindra**
*Principal*

# CONTENTS


| | Page Nos. |
|---|---|
| Preface | 1 |
| Programme Schedule | 3 |
| Resource Persons | 4 |
| List of Participants | 6 |
| Snakes | 7 |
| Birds | 10 |
| Tsunami : Waves of Destruction | 12 |
| Vermicomposting | 17 |
| Sports Nutrition | 23 |
| Origami | 34 |
| Eyecare | 47 |
| Opinions of Students | 55 |

# PREFACE

## SUMMER SCIENCE CAMP

Teaching of science should not be confined to the four walls of the classroom. To make learning of science interesting it is imperative that varied opportunities are provide to the students. In order to kindle the children's interest in science and develop scientific temper a Summer Science Camp was organized from 9th May to 14th May 2005 at the Regional Institute of Education, Mysore, for students of standards VII and VIII of DMS, and on an experimental basis to see the efficacy of such camps for students of Vijaya Vittala Vidyashala and Rotary West School. The camp was organized as a part of the activities of the Exploratory Centre of the Institute, with the following objectives to allow children to have hands on experience on varied activities in science

- to plan an investigation and explore
- to allow them to unfold the different concepts on their own
- to develop the ability to observe keenly
- to develop scientific temper
- to prepare models
- to see the relevance of the science they learnt in the classroom in their day to day life

The Camp was inaugurated by Prof. G Ravindra, Principal, Regional Institute of Education, Mysore with Dr. G.T.Bhandage, Dean, Prof & Head, DESM, highlighting the importance of such camps. Students should enhance their curiosity by seeking explanations to the phenomena they observe, he said. He mentioned that students should have an open mind, should not be disheartened if their experiments fail for failures have always been stepping stones to new discoveries in science. Mrs. Shubha Kesavan, Headmistress, DMS, Mysore explained to the students what they have to look for in such camps.

The topics were of a varied nature from Origami, Sports Nutrition, Tsunami, Personality Development, Wildlife, Birds& Bird Watching, Eye care, Model making, to Physics & Chemistry Activities, Clay modeling and visit to a farm to observe how vermicomposting is done. The sessions on Origami introduced the children to the various aspects of paper cutting with emphasis on its use to make faces of wild animals, applications in mathematics and science, especially the human body and the heart. The importance of taking the right type of diet to be a good sports person was highlighted in the session on Sports Nutrition. Tsunami, the recent tragedy which struck India on 26th December 2004 in which many people lost their lives and were rendered homeless, was received with keen interest by the students. They were keen on knowing how tsunami occurs, know about the warning systems and the precautions to be taken in the event there is another tsunami.

Personality development is no less important to mould the children. Students were taught how to concentrate and how to improve their memory by performing simple activities. Wildlife seemed to catch the attention of the students as it was presented through a slide show. The habitat, the lifestyle, food habits, of different animals, where they are found and the importance of conserving wildlife were highlighted.

Who doesn't like our winged friends? The beautiful feathered friends were introduced both through a slide show and bird watching. Physics and Chemistry activities introduced the children to many important concepts. The sessions on model making appraised the students of the importance of low cost apparatus in studying science by preparing simple models for performing simple hands on activities. In fact students exhibited models made by them on the last day. The importance of vermicomposting was introduced by visit to a farm where it is practiced. Children were gifted each a papaya seedling to plant in their homes. During the eye care lecture common injuries, common defects and how to take care of the eye was dealt with. Children exhibited their awareness of how common injuries occur. The eyesight of the children was also tested and some were advised to wear glasses. A written quiz competition was conducted in which Mahantesh and Bhoomica of Vijaya Vittala Vidyashala, Mysore secured the first and second prizes and Spandana Jagannath of DMS, RIE, Mysore secured the third prize

The Valedictory function was held on the 14th of May, when Dr. P.R.Lalitha, Convener of the Exploratory Centre and Academic Coordinator of the camp gave a brief report of the activities conducted during the camp. Malavika, and Bhoomica expressed their views about the camp. They felt that such camps are eye openers to students in view of the fact that they were exposed to many of the topics in the camp which are not normally dealt with in the class. The camp provided better opportunity to express their views freely, they opined. They expressed that more such camps of a slightly longer duration with many more outdoor activities should be organized. They hoped that they would have many more opportunities to participate and that the other students would also be benefited by such camps. Prof. G. Ravindra visited the exhibition of models that were developed as a part of the camp. In his valedictory address he said that he was happy to note that the children actively participated in all the activities. He advised them to further their thinking and find out more about what they had learnt during the camp and see the relevance of what they learnt to their life. He also gave away the certificates to the participant children.

**P.R.Lalitha**
**Convener, Exploratory Centre**
**& Academic Coordinator,**
**Summer Science Camp**

# REGIONAL INSTITUTE OF EDUCATION, MYSORE

## SUMMER SCIENCE CAMP

**9th to 14th May, 2005**

**Programme Schedule**

| **Day and Date** | **9-10-30 am** | **10-45-1.00pm** | | **2.00-4.00pm** | |
|---|---|---|---|---|---|
| Mon<br>9/5/2005 | Inauguration | Origami<br>J Srinivas | | Physics Activities<br>BKC +PRL | |
| Tue<br>10/5/2005 | Sports Nutrition<br>Prof.Saraswathi | Personality development<br>Sasal Aradhya | | Zoo Outreach Activity<br>Zoo Authorities | |
| Wed<br>11/5/2005 | Snakes<br>Snake Shyam | Tsunami<br>Prof. C.Srikantappa | | Birds<br>Prof. K.B.Sadanand | |
| Thu<br>12/5/2005 | Visit to Karanji Lake PRL+SPK | | | Origami in Maths<br>A.V.Sastry | |
| Fri<br>13/5/2005 | Chemistry Activities<br>GRP +BPV | Origami in Science<br>Prabhu Mutt | | Aquarium<br>SPK | Visit to Gokul Farm<br>SPK+PRL |
| Sat<br>14/5/2005 | Clay Modelling<br>SPK+PRL | Eye Care<br>Dr H.R.Manikarnika | Science Park<br>PRL | Exhibition | Valedictory |

## RESOURCE PERSONS

### External Resource Persons

Prof. Saraswathi,
Department of Food and Nutrition,
University of Mysore,
Mysore.

Mr J. Srinivas
Natural History Museum,
Mysore.

Mr. Sasal Aradhya,
Project Officer,
Nodal Centre,
Sri Jayachamarajendra College of Engineering,
Mysore.

Snake Shyam,
259, 5th A Main,
Brindavan Extension,
Mysore.

Prof. K.B.Sadanand,
11, Temple Road,
Jayalakshmipuram,
Mysore.

Dr. C. Srikantappa,
Prof & Head,
Dept. of Geology,
University of Mysore,
Mysore.

Mr A.V. Sastry,
520, II Cross,
Jayanagar
Kolar.

Dr H.R.Manikarnika,
Principal
Health and Family Welfare Centre,
Mysore

Mr. Sambamurthy,
Gokul Farm,
Yelwal,
Mysore

## INTERNAL RESOURCE PERSONS

Dr. P.R.Lalitha,
Reader in Physics,
RIE, Mysore.

Dr. G.R.Prakash,
Reader in Chemistry,
RIE, Mysore.

Dr. S.P.Kulkarni,
Senior Lecturer,
RIE, Mysore.

Mrs B.P Veenakshi,
TGT
DMS, Mysore.

## LIST OF PARTICIPANTS

| Sl.No | Name of the student | Class & Section | Area of Interest | Activities interested in |
|---|---|---|---|---|
| **Demonstration School** | | | | |
| 1 | L Harshita | VI A | Observing nature | Clay modelling |
| 2 | G.P.Chaitra | VI A | Science | Clay modelling |
| 3 | Nisha D | VI A | Biology | Clay modelling |
| 4 | Thejas Urs | VI A | Science | Doing Experiments |
| 5 | A.B. Mohit Kushalappa | VI A | Science | Projects & Preparing Models |
| 6 | Sushruth H | VI A | Electronics,Chemistry | Clay modelling ,Science projects & doing experiments |
| 7 | M.N.Nandan. | VI A | Physics | Preparing Models |
| 8 | Amulya M | VI A | Science | Clay Modelling |
| 9 | Abhinandan Keshav | VI A | Physics | Preparing Models |
| 10 | S. Sharath | VI A | Science | Doing Experiments |
| 11 | Suhas Pradhan | VI A | Biology | Doing Experiments & Science Projects |
| 12 | Nidhi G V | VI A | Science | Doing Experiments |
| 13 | Sunadh Hebbar | VI B | Science | Doing Experiments |
| 14 | Shambhavi | VII A | Biology & Environment | Clay modelling & Science Projects |
| 15 | Sadhana Jagannath | VII A | Biology & Spacet | Doing Experiments |
| 16 | Spandana Jagannath | VII A | Biology & Environment | Doing Experiments |
| 17 | Bhavya K Shetty | VII A | Biology | Science Experiments & Models |
| 18 | M.L.Varun | VII A | Biology | Clay modelling & Doing Science Experiments |
| 19 | Sahitya S | VII A | Physics & Chemistry | Science Models Science Projects & Charts |
| 20 | Hepzibah F | VII A | Environmental Science | Doing Experiments |
| 21 | Samanjas M R | VIIA | Science | Clay modelling & Doing Science Experiments |
| 22 | Malavika | VII A | Science | Doing Experiments |
| 23 | Ikena W | VII A | Science | Doing Experiments |
| 24 | Anoop R Kaushik | VII B | Science | Doing Experiments |
| 25 | Nitin Pal Singh | VII B | Biology | Science Models |
| 26 | Suraj L L | VII B | Biology | Science Models |
| **Vijaya Vittala Vidyashala** | | | | |
| 27 | Mahantesh | VIII | Science | Doing Experiments |
| 28 | Bhoomica | VIII | Science | Doing Experiments |
| 29 | Ajay Kaushik | VII | Science | Doing Experiments |
| 30 | Vinayak Aloor | VII | Science | Doing Experiments |
| **Rotary West School** | | | | |
| 31 | Akhila | VII | Science | Doing Experiments |
| 32 | Prahallad | VII | Science | Doing Experiments |
| 33 | Ananda krishna | VII | Physics | Doing Experiments |
| 34 | Ambika | VI | Biology | Doing Experiments |
| 35 | Nitin Kashyap V | VI | Chemistry & Biology | Doing Experiments |
| **Pushkarni** | | | | |
| 36 | Vivek | VII | Physics & Chemistry | Experiments |

# SNAKES

**Snake Shyam**
**259, 5th A Main,**
**Brindavan Extension,**
**Mysore.**

Snake is an animal with a long body covered with scales. It has no legs and uses its belly when it moves on land. It has eyes which are not covered with eyelids but scales. Therefore the eyes of the snake are always open. Its vision is good only for a short distance and can easily see movements. It cannot differentiate colors. Snakes have a narrow forked tongue which it often flicks out. It has an organ at the top of the buccal cavity which is called as the Jacobson organ. The tongue brings odors to this organ when the tongue touches it and thus the snake detects the presence of its prey.

Snakes belong to the class of animals called reptiles. They maintain a fairly constant body temperature which ranges from $20^0$ C to $35^0$ C. This they do by basking in the sun when they are to raise their body temperature and lower it by moving into the shade.

Snakes live almost everywhere on the earth. They live in deserts, oceans, forests, streams and lakes. Mainly they are found on the ground but some of them live underground too. Some snakes live on the trees and some others spend most of their time in water. They cannot live in places where the ground is frozen throughout the year, in polar regions or on high mountain tops. They are also not found in islands for example the Maldives, New Zealand and Ireland.

There are about 2700 varieties of snakes. Major varieties dwell in the tropics. The largest snake is the Anaconda of South America and the python of Asia. They grow upto 9 metres in length. The smallest is the Braminy blind snake which grows only 15 centimetres long. Blind snakes can probably distinguish only light and dark, In India the worm snake is the smallest and the largest is the python.

Snakes are both venomous and non venomous. About 270 varieties of them possess venom that is harmful to human beings. About 25 kinds cause most of the deaths from snakebites. Some people dislike snakes and fear them because they are venomous and because of their appearance and strange ways of life. Snakes are worshipped in India, and also have been the subjects of many myths and superstitions like a snake drinks milk, it keeps its enmity for a period of 12 years and the like. But all these beliefs are false. Such fears arise due to a lack of knowledge about the animals. Many of the snakes are not harmful. In fact, they are helpful to mankind as they control the population of the rodents which are 3 times our population and destroy the food articles.

Snakes vary greatly in their body shape, scales and colour. The colours we see are due to special pigment cells in deep layers of the skin, but some colours are due to the way the light is reflected from the surface of the scales. Most snakes have a drab coloring which matches their surroundings. Snakes possess skull, vertebrae, ribs, lungs in some

cases, liver, kidneys and the reproductive organs. In most snakes, the digestive system which includes the stomach and the intestines, is specially suited to handle bulky food. Snakes can digest the entire body of their prey, except the hair and feathers of their prey. It requires as many as 72 hours to completely digest the bones. Snakes feed on birds, eggs. snakes and small animals.

The scaly skin of the snake has two layers. The inner layer contains cells that grow and divide. The cells die as they are pushed upward by the new cells. The outer skin is made up of the dead cells. From time to time the snake sheds its skin because it is worn out. Snakes shed their skin, a process called moulting. For a short time before moulting they become less active. Its eyes become clouded and then clear just before it moults. While shedding its skin it rubs its mouth against a rock or a branch of a tree. It then moves forward and the skin is shed. This process can be compared to the removal of our socks. After shedding its skin it becomes aggressive.

Snakes reproduce sexually. During breeding female snakes release an odor which helps it select the male to mate. Most snakes lay eggs. The females generally lay them in shallow holes, tree stumps, rotten logs or such similar places. The number of eggs a female lays varies greatly among the different species. In many species, the female lays 6 to 30 eggs at a time. Vipers lay around 75 eggs and Cobras around 18 –20 eggs. Large pythons lay about 50 eggs, but they occasionally produce more than 100. About a fifth of the species of snakes bear live young ones, example being the green wine viper and sand bower.

Many kinds of animals prey on snakes. They therefore have a wide variety of defense mechanisms. Some change their colour, some escape into holes or burrows, some make threatening noises, others produce threatening noises. The Cobra defends itself by offering a threatening posture that may frighten away its prey, some lie playing dead as many animals do not like dead snakes. Pythons coil themselves into a ball. If other defences fail they attack and bite their enemies.

Why do people die of snake bites. It is mostly due to dehydration and shock. Snakes are mostly shy but bite people if by accident they are trodden. Most snake bites occur on the foot or lower leg, with a few on the arm or hand.

Snakebites are to be treated depending on whether the snake is a poisonous one or a nonpoisonous one. A poisonous snakebite requires an urgent medical attention. In the case of non poisonous snakebites the area can be washed thoroughly with water and soap. It is not advisable to do so in the case of poisonous snakebites, because the venom traces present in the area can help the doctor to identify the species and select the right antivenom to treat the patient.

In the case of a venomous snakebite the first advisable thing to do is to call the doctor urgently and in the absence of one in the nearby locality, the victim should be transported to the hospital straightaway. The victim must be kept as still and quiet as possible, since any movement will help the poison to spread throughout the body. The limb with the bite must be kept below the level of the heart so that the absorption of the venom by the body is delayed. A bitten leg should be rested on a pillow while an arm must be placed in a sling. The victim must be treated for shock.

Usually a swelling occurs in the area around the bite within a few minutes of the attack. However, if such a swelling is not seen then a little of the venom must have been injected into the body and the patient should recover quickly. The patient in such case should be kept under observation for at least 12 hours. The person offering first aid should not cut or suck the wound as this may result in secondary infection or loss of blood. If the victim is not suffering from nausea, he may be given plenty of water to drink. Paracetamol may be given to reduce the pain but aspirin should not be given as this may stop the blood from clotting properly.

Snakes are important because they are a part of the environment and they help maintain the balance of nature. Snake venom has several uses in medicine and biological research. Antivenin, used to treat snakebites is prepared from he blood serum of horses injected with the venom. Neurotoxins in the venom are used for preparing certain pain killing drugs. The powerful enzymes present in the venom to breakdown complex proteins for biochemical studies.

In general snakes are abundant in most parts of the world. Human beings have caused a decline in some of the species either because of overhunting or for farms, building dwellings or industries. Snake skins are used to make belts and handbags. Several countries have laws to prevent the importation of such items so as not to endanger the species further. Snakes can be handled if one has respect for them and is not overconfident.

# BIRDS

**Prof K.B.Sadanand,**
**Jayalakshmipuram,**
**Mysore**

All like birds because they are colorful and sprightly creatures, fond of movement and are always active, talking to each other. Most of the birds have a wonderful repertoire of songs and calls. If one starts observing the birds all of them start appearing beautiful, even the parakeet. They are blessed in that they enjoy freedom which we all envy and would like to enjoy. There are many birds in our country. The ornithologists are those who study the birds and the field of study is called ornithology. India has produced the world famous ornithologist Dr Salim Ali. He travelled over the length and breadth of India and the subcontinent extending from Afghanistan to Burma and Tibet to Kanyakumari and Srilanka. He built up a wonderful team of young ornithologists then. According to them in India we have 1300 species of birds. If India has so many then what about the world. In the world we find 9000 species. Some species are not found in India. To name a few , they are the parakeet, nightingale and the penguin. We need to be familiar with the birds in our country. To reach our destination we depend on local transport, railways, airways and buy tickets. To go abroad we not only buy tickets and travel by air but we also need a passport and a visa, which the birds do not need. Of the 1300 species found in India about 300 birds come from countries like Siberia, Europe, China and Africa. They just come. In fact migration of birds is a fascinating phenomena. The birds come only at certain times of the year, mostly in winter. They migrate from the northern hemisphere to the southern hemisphere, the reason being the extreme cold weather, short daytime to search food and lack of fruits and insects. We are close to the tropic. Days are longer making it easier to find food. The birds are wonderful in that they live most of the time in the air. They are aerial creatures. They fly most of the time. Accordingly their bodies are streamlined. They are pointed at the beaks and the tail. Two of there are modified into wings which cover their body. Legs are modified according to their habitat. They are light because their bones are hollow. Air flows into these cavities making their body light. Their body metabolism is more because they are to fly. Their body temperature is around 40 $^{o}$C to 42 $^{o}$C . No machine can match it in its manouvering capability. A tiny bird as small as a sparrow can fly anywhere and can turn anywhere. The body morphology of birds is also wonderful. They have a mouth like a beak which is adapted to the type of food they take. Their feet are also different. If they have to walk they have pointed fingers and if they are to swim they have webbed feet. All these put together the bird morphology is well suited to the functions they perform. They have nostrils, tongue and eyes. Their eyesight is very sharp. Birds which we notice at a distance of 15ft from us would have already noticed us from a distance of about half a kilometre. Birds which can see only in the night as the owl have special type of eyes.

Why should we observe birds and worry about them?. They are important from several points of view, and even for economic reasons. They are not only good sources of food, but also indulge in dispersal of fruits and seeds and are good

pollinating agents. When they congregate, their droppings can be used as fertilizers. Many of the birds live in clean water. For example the kingfisher does not live in muddy and unclean water. In Fact if no bird life is seen near water lakes then it is indicative of the fact that the water is polluted. The best places to observe birds are lakes and water tanks. Birds can be identified by their sounds. What do we require for bird watching?

- Interest
- Dull clothing
- Keeping our eyes and ears open
- Maintenance of silence
- A book to note down the name of the bird sighted, time at which it was sighted, name of the place at which it was sighted, its color and size etc.

Such a` field diary` helps us in the correct identification of birds.

**Excerpts from the Lecture delivered by Dr C Srikantappa, Prof. & Head, Department of Geology, University of Mysore, Mysore.**

**What is a tsunami?**

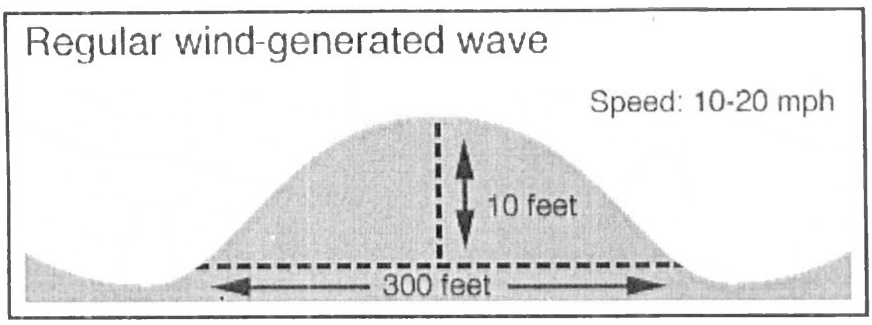
A tsunami is a wave train, or series of waves, generated in a body of water by an impulsive disturbance that vertically displaces the water column. Earthquakes, landslides, volcanic eruptions, explosions, and even the impact of cosmic bodies, such as meteorites, can generate tsunamis. Tsunamis can savagely attack coastlines, causing devastating property damage and loss of life. Although a relatively rare event, since 1992 tsunamis have claimed over 2,000 lives worldwide. The tsunamis were caused by earthquakes in Japan, Indonesia, and Nicaragua. Damage to cities along coastlines has been in millions of dollars.

**What does "tsunami" mean?**

Tsunami is a Japanese word with the English translation, "harbor wave." Represented by two characters, the top character, "tsu," means harbor, while the bottom character, "nami," means "wave." In the past, tsunamis were sometimes referred to as "tidal waves" by the general public, and as "seismic sea waves" by the scientific community. The term "tidal wave" is a misnomer; although a tsunami's impact upon a coastline is dependent upon the tidal level at the time a tsunami strikes. Tsunamis are unrelated to the tides. Tides result from the imbalanced, extraterrestrial, gravitational influences of the moon, sun, and planets. The term "seismic sea wave" is also misleading. "Seismic" implies an earthquake-related generation mechanism, but a tsunami can also be caused by a nonseismic event, such as a landslide or meteorite impact.

**How do tsunamis differ from other water waves?**

Tsunamis are unlike wind-generated waves, which many of us may have observed on a local lake or at a coastal beach, in that they are characterized as shallow-water waves, with long periods and wave lengths. The wind-generated swell one sees at a California beach, for example, spawned by a storm out in the Pacific and rhythmically rolling in, one wave after another, might have a period of about 10 seconds and a wave length of 150 m. A tsunami, on the other hand, can have a wavelength in excess of 100 km and period of the order of one hour.

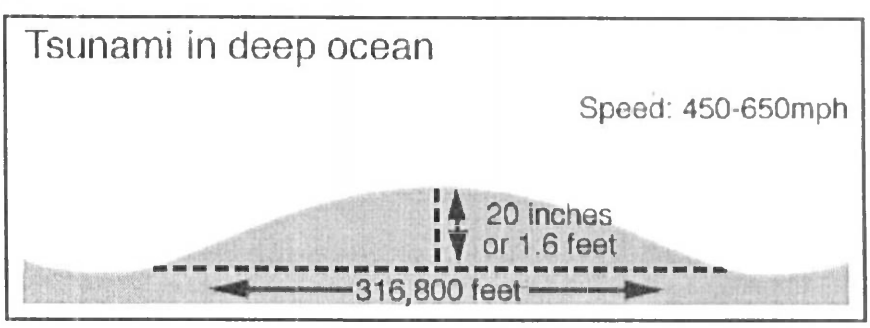



As a result of their long wave lengths, tsunamis behave as shallow-water waves. A wave becomes a shallow-water wave when the ratio between the water depth and its wave length gets very small. Shallow-water waves move at a speed that is equal to the square root of the product of the acceleration of gravity (9.8 m/s/s) and the water depth - let's see what this implies: In the Pacific Ocean, where the typical water depth is about 4000 m, a tsunami travels at about 200 m/s, or over 700 km/hr. Because the rate at which a wave loses its energy is inversely related to its wave length, tsunamis not only propagate at high speeds, they can also travel great, transoceanic distances with limited energy losses. In the earthquake-generated 1960 Chilean tsunami across the Pacific, the tsunami travelled over a vast area. Japan, which is over 17,000 kms away from the tsunami's source off the coast of Chile, lost 200 lives to this tsunami.

The wave crests bend as the tsunami travels - this is called refraction. Wave refraction is caused by segments of the wave moving at different speeds as the water depth along the crest varies. *Tsunamis are only about a meter high at the most in the open ocean.*

**How do earthquakes generate tsunamis?**

Tsunamis can be generated when the sea floor abruptly deforms and vertically displaces the overlying water. Tectonic earthquakes are a particular kind of earthquake that are associated with the earth's crystal deformation; when these earthquakes occur beneath the sea, the water above the deformed area is displaced from its equilibrium position. Waves are formed as the displaced water mass, which acts under the influence of gravity, attempts to regain its equilibrium. When large areas of the sea floor elevate or subside, a tsunami can be created.

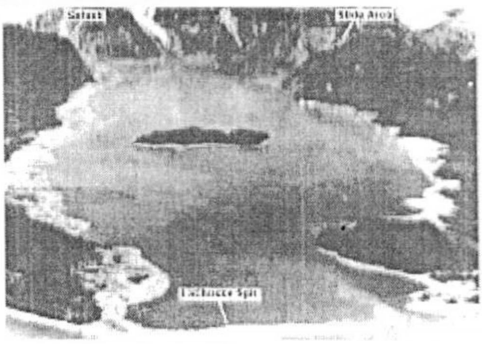



Large vertical movements of the earth's crust can occur at plate boundaries. Plates interact along these boundaries called faults. Around the margins of the Pacific Ocean, for example, denser oceanic plates slip under continental plates in a process

known as subduction. Subduction earthquakes are particularly effective in generating tsunamis.

**How do landslides, volcanic eruptions, and cosmic collisions generate tsunamis?**

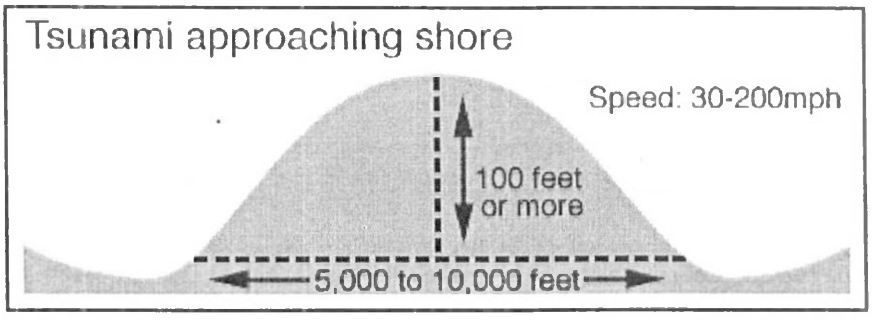
A tsunami can be generated by any disturbance that displaces a large water mass from its equilibrium position. In the case of earthquake-generated tsunamis, the water column is disturbed by the uplift or subsidence of the sea floor. Submarine landslides, which often accompany large earthquakes, as well as collapses of volcanic edifices, can also disturb the overlying water column as sediment and rock slump downslope and are redistributed across the sea floor. Similarly, a violent submarine volcanic eruption can create an impulsive force that uplifts the water column and generates a tsunami. Conversely, supermarine landslides and cosmic-body impacts disturb the water from above, as momentum from falling debris is transferred to the water into which the debris falls. Generally speaking, tsunamis generated from these mechanisms, unlike the Pacific-wide tsunamis caused by some earthquakes, dissipate quickly and rarely affect coastlines distant from the source area.



This image shows Lituya Bay, Alaska, after a huge, landslide-generated tsunami occurred on July 9, 1958. The earthquake-induced rockslide, shown in upper right-hand corner of this image, generated a 525 m splash-up immediately across the bay, and razed trees along the bay and across LaChausse Spit before leaving the bay and dissipating in the open waters of the Gulf of Alaska. Source: Lander, and P. Lockridge

**What happens to a tsunami as it approaches land?**

As a tsunami leaves the deep water of the open ocean and travels into the shallower water near the coast, it transforms. A tsunami travels at a speed that is related to the water depth - hence, as the water depth decreases, the tsunami slows. The tsunami's energy flux, which is dependent on both its wave speed and wave height, remains nearly constant. Consequently, as the tsunami's speed diminishes as it travels into shallower water, its




height grows. Because of this shoaling effect, a tsunami, imperceptible at sea, may grow to be several meters or more in height near the coast. When it finally reaches the coast, a tsunami may appear as a rapidly rising or falling tide, a series of breaking waves, or even a bore.

**What happens when a tsunami encounters land?**

As a tsunami approaches shore, we've learned that it begins to slow and grow in height. Just like other water waves, tsunamis begin to lose energy as they rush onshore - part of the wave energy is reflected offshore, while the shoreward-propagating wave energy is dissipated through bottom friction and turbulence. Despite these losses, tsunamis still reach the coast with tremendous amounts of energy. Tsunamis have great erosional potential, stripping beaches of sand that may have taken years to accumulate and undermining trees and other coastal vegetation. Capable of inundating, or flooding, hundreds of meters inland past the typical high-water level, the fast-moving water associated with the inundating tsunami can crush homes and other coastal structures. Tsunamis may reach a maximum vertical height onshore above sea level, often called a runup height, of 10, 20, and even 30 meters.

The picture shows the 1923 Kanto tsunami attacking a Japanese village. Note that the structures in this model are rigid - in a real-life tsunami, coastal structures often are destroyed.

**Warning Systems**

Because of the small wave height a tsunami has during much of its journey through deep water, a reliable early detection system for tsunamis has yet to be developed. The Pacific Tsunami Warning Center (PTWC) in Hawaii is the regional operational center for tsunami information in the Pacific. Two types of bulletins are released to advise of a possible approaching tsunami, a Tsunami Watch Bulletin and a Tsunami Warning Bulletin.

A Tsunami Watch Bulletin is released when an earthquake occurs with a magnitude of 6.75 or greater on the Richter scale.

A Tsunami Warning Bulletin is released when information from tidal stations indicates that a potentially destructive tsunami exists. Tidal stations record information about the water around them and issue a warning when characteristics of the sea begin to match those of a potential tsunami.

Unfortunately, this system is not very reliable. Seventy-five percent of all warnings issued since 1948 have been false. For example, Honolulu was evacuated in 1948 on a false alarm at a cost of more than $30 million dollars.

**What to do when a tsunami hits?**

How can you tell if a tsunami is coming? The violent shaking of an earthquake is often the first clue, but most of these earthquakes occur far out to sea and give little or no indication that a tsunami is on the way.

An obvious clue is when the water in a bay, a harbor, or along the beach suddenly rushes out to sea, leaving fish and boats stranded. When this happens, you can be sure that a tsunami will hit at any time in the next five to thirty minutes.

Here are some tips:

- If you are in a dangerous area, immediately turn off the water, gas, and electricity and quickly move to higher ground. Remember, once a Tsunami Warning is issued, it could be a matter of minutes, or even seconds, before the wave hits.

- If a Tsunami Warning is issued, NEVER go down to the beach to watch the wave come in; you won't live to tell the story. Remember also that a tsunami is a series of waves. Often the first wave may be the least dangerous. The waves may get progressively worse as time goes by. Listen to a portable radio to learn when it is safe to return home.

- After a tsunami has hit, all food and water should be tested for contamination before it is eaten. All buildings should be checked for gas leaks and electrical shorts before anyone enters. Administer first aid only if you know what to do.

- Stay tuned to local radio and TV stations, especially NOAA Weather Radio, for evacuation orders if a Tsunami Warning has been issued. Do NOT return to low-lying areas until the tsunami threat has passed and the all clear has been announced.

References:

http://observe.arc.nasa.gov/nasa/exhibits/tsunami/tsun_hit.html

# VERMICOMPOSTING

**P.R.Lalitha,**
**Reader in Physics,**
**RIE, Mysore**

**( A visit to Gokul farm maintained by Mr K. Sambamurthy, was organized for the students to see how vermicomposting is done and learn about the advantages of using vermicompost as manure. An attempt is made in this article to illustrate the details of vermicomposting. Each child brought home a papaya sapling which was grown using vermicompost)**

Vermicomposting uses earthworms to turn organic wastes into very high quality compost. This is probably the best way of composting kitchen wastes. Adding small amounts of wet kitchen scraps to a large compost pile in the garden day by day can disrupt the decomposition process so that the compost is never really done. But it works just fine with vermicomposting.

Many gardeners use vermicomposting systems for all their garden and kitchen wastes, many more use both types of composting, and thousands of households without gardens use neat and unobtrusive worm boxes indoors to compost their kitchen scraps (as well as newspapers and cardboard boxes), reducing their garbage by up to a third and providing their own organic soil for pot plants and container gardens on balconies and roofs to grow their own healthy food.

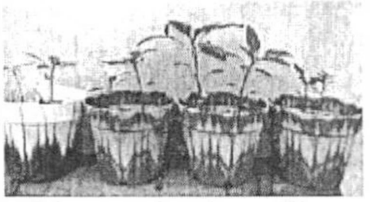
George Sheffield Oliver, was one of the first to harness the earthworm to the needs of the farmer and gardener, making highly fertile topsoil for optimum crop growth, and producing a constant supply of cheap, high-grade, live protein to feed poultry. He devised simple yet elegant and effective systems to bring costs and labour down and productivity up, to help struggling farmers make ends meet. Oliver had an observant and critical eye and understood Nature's round. His ideas on the nature of modern food and health (or the lack of it) are only now being confirmed, half a century later.

**Vermicompost and plants**

Worm casts -- the best soil there is

Vermicompost consists mostly of worm casts (poop) plus some decayed organic matter. In ideal conditions worms can eat at least their own weight of organic matter in a day. In fact it seems they don't actually eat it -- they consume it, sure enough, but what they derive their nourishment from is all the micro-organisms that are really eating it. And yet -- mystery! -- their casts contain eight times as many micro-organisms as their feed! And these are the micro-organisms that best favour healthy plant growth. And the casts don't contain any disease pathogens -- pathogenic bacteria are reliably killed in the worms' gut. This is one of the greatest benefits of vermicomposting.

Worm casts also contain five times more nitrogen, seven times more phosphorus, and 11 times more potassium than ordinary soil, the main minerals needed for plant growth, but the large numbers of beneficial soil micro-organisms in worm casts have at least as much to do with it. The casts are also rich in humic acids, which condition the soil, have a perfect pH balance, and contain plant growth factors similar to those found in seaweed. There's nothing better to put in your garden!



Chinese spinach seedlings grown with (from left) chemical fertilizer, powdered horse manure, vermicompost, and nothing.

-- "Worms seem to be the great promoters of vegetation, which would proceed but lamely without them, by boring, perforating, and loosening the soil, and rendering it pervious to rains and the fibres of plants, by drawing straws and stalks of leaves and twigs into it, and, most of all, by throwing up such infinite numbers of lumps of earth called worm-casts, which, being their excrement, is a fine manure for grain or grass." -- The Rev. Gilbert White of Selborne, 1777

-- "All the fertile areas of this planet have at least once passed through the bodies of earthworms." -- Charles Darwin, "The Formation of Vegetable Mould through the Action of Worms with Observations on their Habits", John Murray, London, 1881

**The worms**

These are not the usual big burrowing earthworms that live in garden soil. Called red worms, tiger worms, brandlings, angle worms, manure worms, or red wrigglers, they occupy a different ecological niche, living near the surface where there are high concentrations of organic matter, such as on pastures or in leaf mould, or under compost piles. Two breeds are used in vermicomposting: *Eisenia foetida* or *Lumbricus rubellas*. Many garden centres now supply them, and in most countries

they can be bought by mail order from worm farms. Some sellers advertise special high-performance breeds or specially developed hybrids, but don't believe them -- they'll be one of these two breeds. There's no such thing as a hybrid worm. 1,000 worms (1 lb) are needed to start a worm box, maybe twice that if garden wastes too are to be processed -- they breed very fast in the right conditions, but starting with more will give the system a good start.

**Breeding**

Worm populations double each month. In ideal conditions they can reproduce much faster than that: 1 lb of worms can increase to 1,000 lbs (one million worms) in a year, but in working conditions 1 lb will produce a surplus of 35 lbs in a year, because hatchlings and capsules (cocoons or eggs) are usually lost when the vermicompost is harvested.

Mature redworms make two or three capsules a week, each producing two or three hatchlings after about three weeks. The hatchlings are tiny white threads about half an inch long, but they grow fast, reaching sexual maturity in four to six weeks and making their own capsules. Three months later they're grandparents! This rapid breeding rate means the worm population easily adjusts to conditions in the worm box according to the feed supply and the proportion of worm casts to feed and bedding -- their casts are slightly toxic to them, and as the box gets "full" they'll either leave, if there's anywhere for them to go, or they'll die off. This is an important consideration -- if one wants the vermicompost for the garden it doesn't much matter if the worms die off, as long as some are kept aside to set a new box going. It also makes it easier to harvest the castings, and higher proportion of pure castings can thereby be had. But if one wants to produce excess worms as well, to extend one's worm system, for sale as fishing bait, or to feed to poultry or fish (they really thrive on wormfeed), one needs to separate them from the vermicompost before the proportion of castings gets too high.

Millions of tons of food waste are buried or burned each year at considerable financial and environmental cost. Instead of discarding food scraps, one can recycle them with the help of worms. Vermicomposting (worm composting) turns many types of kitchen waste into a nutritious soil for plants. When worm compost is added to soil, it boosts the nutrients available to plants and enhances soil structure and drainage.

- Vermicomposting food waste offers several advantages:
- It reduces household garbage disposal costs;
- It produces less odor and attracts fewer pests than putting food wastes into a garbage container;
- It saves the water and electricity that kitchen sink garbage disposal units consume;
- It produces a free, high-quality soil amendment (compost);
- It requires little space, labor, or maintenance;
- It spawns free worms for fishing.

**Equipment and Supplies**

The materials needed to start a vermicomposting system are simple and inexpensive. All you will need are a worm bin, bedding, water, worms and your food scraps.

• **Worm Bin**. A suitable bin can be constructed of untreated, non aromatic wood, or plastic container to be purchased. A wooden box is better if the worms are kept outdoors, because it will keep the worms cooler in the summer and warmer in the winter. An outdoor wooden bin can even serve double-duty as a bench. If a plastic container is used, it should be thoroughly washed and rinsed before the worms and bedding are added. The bin size depends on the amount of food produced in the household. The general rule of thumb is one square foot of surface area for each pound of garbage generated per week.

For two people (producing approximately 3½ pounds of food scraps per week), a box 2 feet wide, 2 feet long, and 8 inches deep should be adequate. A 2-foot-by-3-foot box is suitable for four to six people (about 6 pounds of waste per week). Redworms (the type used for vermicomposting) thrive in moist bedding in a bin with air holes on all sides. For aeration and drainage, drill nine l/2-inch holes in the bottom of the 2-foot-by-2- foot bin or 12 holes in the 2-foot-by-3-foot bin. Place a plastic tray under the worm bin to collect any moisture that may seep out. Drilling holes on the upper sides of the bin will also help the worms get needed oxygen and prevent odors in the worm bin. Keep a lid on the bin, as worms like to work in the dark. Store the worm bin where the temperature remains between 55° and 77°F.

• **Bedding.** The worms need bedding material in which to burrow and to bury the garbage. It should be a non toxic, fluffy material that holds moisture and allows air to circulate. Suitable materials include shredded paper (such as black-and-white newspapers, paper bags, computer paper, or cardboard); composted animal manure (cow, horse, or rabbit); shredded, decaying leaves; peat moss (which increases moisture retention); or any combination of these. Glossy paper or magazines should not be used. Add two handfuls of soil to supply roughage for the worms. Adding crushed eggshells provides not only roughage but also calcium for the worms, and it lowers acidity in the bin. About 4 to 6 pounds of bedding is needed for a 2- foot-by-2-foot bin (for two people), and 9 to 14 pounds of bedding should be used in a 2- foot-by-3-foot bin (for four to six people). Worms will eat the bedding, so onewill need to add more within a few months.

• **Water**. The bedding must be kept moist to enable the worms to breathe. To keep bedding moist, add 3 pints of water for each pound 7 of bedding. About 1½ to 2¼ gallons of water for 4 to 6 pounds of bedding is required. If the bedding dries out, use a plant mister to spray some water on it.

• Worms. It is important to get the type of worms that will thrive in a worm bin. Only redworms or "wigglers" which are "composting worms" should be used (do not use night crawlers or other types of worms). Composting worms that are grown and sold will aid one in setting up one's own vermicomposting bin.

• **Food Scraps**. Feed the worms with any non-meat organic waste such as vegetables, fruits, eggshells, tea bags, coffee grounds, paper coffee filters, and shredded garden waste. Worms especially like cantaloupe, watermelon, and pumpkin. The amount of citrus fruits that are added to the bin should be such as to prevent it from becoming too acidic. Food scraps should be broken or cut into small pieces so that they break down easier. Meat scraps or bones, fish, greasy or oily foods, fat, tobacco, or pet or human manure should not be added. The food scraps should be covered completely with the bedding to discourage fruit flies and molds. One pound of worms will eat about four pounds of food scraps a week. If more food is added than the worms can handle, anaerobic conditions will set in and cause odor. This dissipates shortly if adding of food is stopped for a while.

• **Temperature**. Redworms will tolerate temperatures from 50° to 84°F, but 55° to 77°F is ideal. They are also grown outdoors in the coldest areas of the country.

**Starting the Process**

To start the vermicomposting system, first select a location for the worm bin. Popular indoor spots are the kitchen, pantry, bathroom, mud room, laundry room, or basement. If the bin is chosen to be kept outside, put it in the shade during the hot summer and shelter it from the cold in winter by placing it in a garage, or putting hay bales around the bin to allow air to circulate around the bin, and keep it protected from flooding, because the worms can drown.

Next, prepare the bedding. To prepare the bedding with newspapers, fold a section in half and tear off long, half-inch to inch wide strips (go with the grain of the paper and it will tear neatly and easily). Soak the newspaper in water for a few minutes, then wring it out like a sponge and fluff it up as you add the newspaper to the worm bin. Aim for the bedding to be very damp, but not soaking wet (only two to three drops of water should come out when you squeeze the bedding material). Spread the bedding evenly until it fills about three-quarters of the bin. Sprinkle a couple of handfuls of soil (from outdoors or potting soil) into the bedding to introduce beneficial microorganisms and aid the worms' digestive process. Fluff up the bedding about once a week so the worms can get plenty of air and freedom of movement. Gently place the worms on top of the bedding. Leave the bin lid off for a while so the worms will burrow into the bedding, away from the light. The worms will not try to crawl out of the bin if there is light overhead. Once the worms have settled into their new home, add food scraps that have been collected in a leak-proof container. Dig a hole in the bedding (or pull the bedding aside), place the food scraps in the hole, and cover it with at least an inch of bedding. After this first feeding, wait a week before adding more food. Leave the worms alone during this time to allow them to get used to their new surroundings. Bury food scraps in a different area of the bin each time. Worms may be fed any time of the day. Do not worry if they are to be left for a few days, as the worms can be fed as seldom as once a week. *Note:* Do not be surprised to see other creatures in your worm bin, as they help break down the organic material. Most of the organisms will be too small to see, but white worms, springtails, pill bugs, molds, and mites may be spotted.

## Harvesting the Worms and Compost

After about six weeks, *worm castings* (soil-like material that has moved through the worms' digestive tracts) are seen. The castings can be used to boost plant growth. In three or four months, it will be time to harvest the castings. Mixed in with the castings will be partially decomposed bedding and food scraps, in addition to worms. This is called *vermicompost.*

The vermicompost may be harvested by one of two methods:

Method 1: Place food scraps on only one side of the worm bin for several weeks, and most of the worms will migrate to that side of the bin. Then remove the vermicompost from the other side of the bin where food scraps have not been added, and add fresh bedding. Repeat this process on the other side of the bin. After both sides are harvested, begin adding food scraps to both sides of the bin again.

Method 2: Empty the contents of the worm bin onto a plastic sheet or used shower curtain where there is strong sunlight or artificial light. Wait 20-30 minutes, then scrape off the top layer of vermicompost. The worms will keep moving away from the light, so that more compost can be scraped off every 20 minutes or so. After several scrapings, worms will be found in clusters; just pick up the worms and gently return them to the bin in fresh bedding.

*Be on the lookout for worm eggs; they are lemon-shaped and about the size of a match head, with a shiny appearance and light-brownish color. The eggs contain between two and ten baby worms. Place the eggs back inside the bin so they can hatch and thrive in the bin system.*

## Using Worm Compost

The vermicompost can be used immediately or stored and used later. The material can be mulched or mixed into the soil in the garden and around trees and yard plants. It can also be used as a top dressing on outdoor plants or sprinkled on the lawn as a conditioner. For indoor plants, vermicompost can be mixed with potting soil. For top dressing indoor plants, decaying bedding and food scraps may be removed from the castings. Make sure there are no worms or eggs in the castings, because conditions in a plant pot will not allow them to survive. A "compost tea" can be made to feed to the plants. Simply add two tablespoons of vermicompost to one quart of water and allow it to steep for a day, mixing it occasionally. Water the plants with this "tea" to help make nutrients in the soil available to the plants.

## Larger-Scale Vermicomposting

Vermicomposting can take place wherever food scraps are generated or delivered. Worm composting bins can be found in classrooms, apartments, offices, and other commercial locations. Classrooms and outdoor centers are especially nice settings for vermicomposting. Children of all ages enjoy classroom activities involving worms.

# SPORTS NUTRITION

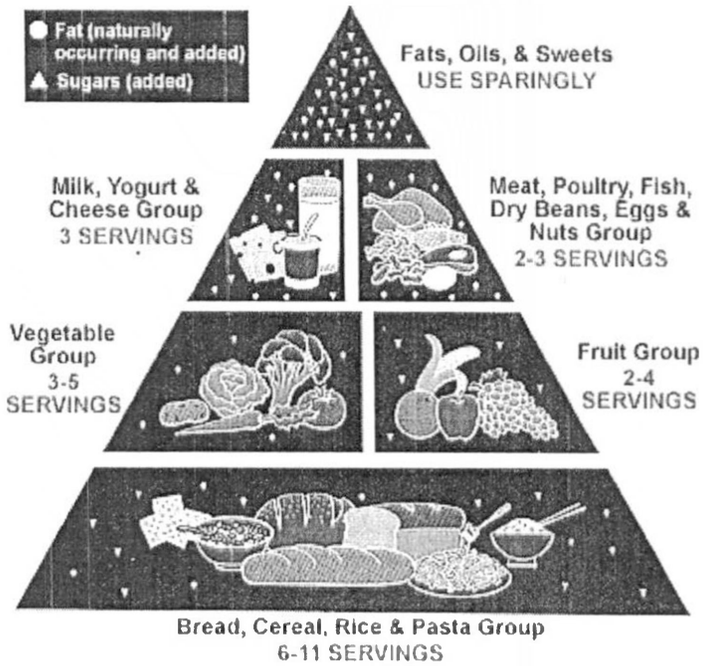
**Dr Saraswathi,**
**Professor & Head,**
**Department of Food and Nutrition**
**University of Mysore, Mysore**

Foods satisfy our hunger, provide energy and nutrients, maintain our health, satisfy our social and psychological needs .Man is made up of what he eats. Food becomes his blood and bones, his size and strength, his energy and stamina.

Nutrition is a science of foods, the process by which the organism ingests, digests, absorbs, transports and utilizes nutrients and disposes off their end products. It also deals with the interaction between nutrients and their relationship to health and disease. Foods provide nutrients and energy . They can be classified as under:

Major Nutrients: Carbohydrates, Protein , Fats and oils, Water
Minor Nutrients : Minerals, Vitamins
Non nutrients : Essential for our health -Dietary fibre, Antioxidants or Phyto chemicals.
Energy providing foods: carbohydrates, proteins, fats and oils. Energy is essential for our existence

How can you tell if your diet is stacking up? Nutritionists have developed a food-guide system in the shape of a pyramid that can help you rate or evaluate your diet. This guide divides food into five groups on the basis of the nutrients each group provides. By eating the recommended amounts of food from each group daily, you can greatly increase your ability to get all the nutrients your body needs--and that will improve your ability on the playing field



Here is some additional information about the food groups that can help you improve your diet.

| FIVE FOODS | NUTRIENTS NON NUTRIENTS | FUNCTIONS |
|---|---|---|
| Cereals & Millets | Starch , Protein<br>B vitamins<br>Calcium<br>Fibre | Energy Production<br>Body building & protection<br>Energy metabolism<br>Bone & teeth, Normal defaecation |
| Fruits and Vegetables | Calcium, Iron<br>BetaCarotene-<br>Vit.A,B Vitamins<br>Vit C , Fibre<br>Phytochemicals | Bone, teeth Haemoglobin<br>Vision and growth<br>Energy metabolism<br>Health of collagen<br>Defaecation, Antioxidants |
| Pulses & oil seeds Flesh foods | Proteins ,<br>Starch,<br>B Vitamins<br>Vitamin A | Body building<br>Energy production<br>Body building &<br>Vision , growth& protection |
| Milk & Milk products | Proteins<br>Riboflavin<br>Vitamin A | Body building protection<br>Energy production<br>Vision, Growth |
| Oil, sugar & jaggery | Fat, Simple sugars | Energy production |

**Why should sportspersons know about nutrition and nutrients?**

More and more stress is being placed on how well you perform. To reach your highest potential, all of your body systems must be perfectly tuned. Nothing is more important to your well-being and ability to perform than good nutrition. Eating the right foods helps you maintain desirable body weight, stay physically fit, and establish optimum nerve-muscle reflexes. Without the right foods, even physical conditioning and expert coaching aren't enough to push you to your best. Good nutrition must be a key part of your training program if you are to succeed.

There is no one "miracle food" or supplement that can supply all of your nutritional needs. Certain foods supply mainly proteins, other foods contain vitamins and minerals, and so on. The key to balancing your diet is to combine different foods so that nutrient deficiencies in some foods are made up by nutrient surpluses in others. Eating a variety of foods is the secret.

The nutrients--the proteins, carbohydrates, fats, vitamins, minerals, and water--are teammates that work together to provide good nutrition. Just as each team member carries out different tasks during a game, each nutrient performs specific functions in your body. A lack of just one nutrient is a disadvantage to your body, just as losing a player to the penalty box is a disadvantage for a hockey team. Your body needs all these nutrients all of the time, so the foods you eat should supply them every day.

Just because you are not hungry does not necessarily mean that your body has all the nutrients it needs. You can fill up on foods that contain mostly carbohydrates and fats, but your body still has basic needs for proteins, minerals, and vitamins. The following table gives a summary of the nutrient, its functions, what the deficiency leads to and the sources of the nutrients.



| Nutrient | Function | Deficiency | Food sources |
|---|---|---|---|
| Carbo-hydrates | To produce energy | Growth retardation-children | Rice, wheat, jowar, ragi, rawa, maida, corn, potato, yam, sugar, jam, honey, banana *etc.* |
| Proteins | To build and repair tissues<br>To produce antibodies, enzymes and hormones | Growth retardation children | Milk, curd, lassi, cheese, paneer, dals, peas, nuts, oilseeds, eggs, fish, meat, poultry |
| Fats | To supply energy in concentrated form | | Groundnut oil, Vegetable oils *etc.* ghee, butter, cream, meat, fats |

| Nutrients | Function | Deficiency | Food source |
|---|---|---|---|
| Minerals-calcium | build bones, teeth<br>Working of muscles & nerves, heart beats and blood clotting | Soft bones, back pain, leg pain, heart, palpitations | Milk, curd, cheese, fish ragi, green leafy vegetables *etc.* |
| Iron | haemoglobin<br>RBC<br>Enhance oxygenation of muscles | Anaemia, pale skin, fatigue, breathing difficulties | Egg, red meats, poultry, organ meats, dark green leafy vegetables |
| Magnesium | Improves muscle strength<br>Helps in carbohydrate metabolism<br>Aids acid/base balance | Nervousness, tremors, Disorientation | Whole grains, green leafy vegetables |

| Nutrients | Function | Deficiency | Food source |
|---|---|---|---|
| Vitamins : Thiamine | - To maintain nervous system healthy<br>- Aids in energy metabolism | Heart beat irregularity, nerve disorders, fatigue, irritability | Whole grains, dhals, wheat products, beans, eggs, poultry, milk *etc.* |
| Riboflavin | - Essential for energy metabolism | Ulcer in the corner of the mouth | Milk, milk products, cowpea, radish leaves. |
| Niacin | - Essential for energy metabolism | Irritability | Groundnuts, liver yeast, prawns, pulses |
| Vitamin $B_{12}$ | - Aids in fat, carbohydrate and protein metabolism | Pernicious anemia | Organ meats, fish, egg, milk |

| Nutrients | Function | Deficiency | Food Source |
|---|---|---|---|
| Vitamin C | -To hold cells together<br>-To help healing of wounds<br>-To help absorption of iron | Low absorption of iron<br>Bleeding gums | amla, guava, citrus fruits, drumstick leaves, radish leaves, tomato |
| Vitamin A | -To help better vision<br>-To keep skin healthy<br>-To help in growth & development<br>-Resistance to infection | Eye disorders | dark green and yellow leafy vegetables, mango, papaya, eggs, milk and milk products |
| Vitamin D | -Aids in absorption of Calcium | Soft bones | sunlight |
| Vitamin E | -Acts as antioxidant<br>-Aids in cellular respiration | Muscle wasting | vegetable oils, green vegetables, wheat germ, organ meat |
| Vitamin K | -Aids in clotting of blood | Clotting of blood is delayed | green leafy vegetables |
| Water | -To regulate body temperature<br>-To maintain acid base balance | dehydration | Water, juices, vegetables, milk |

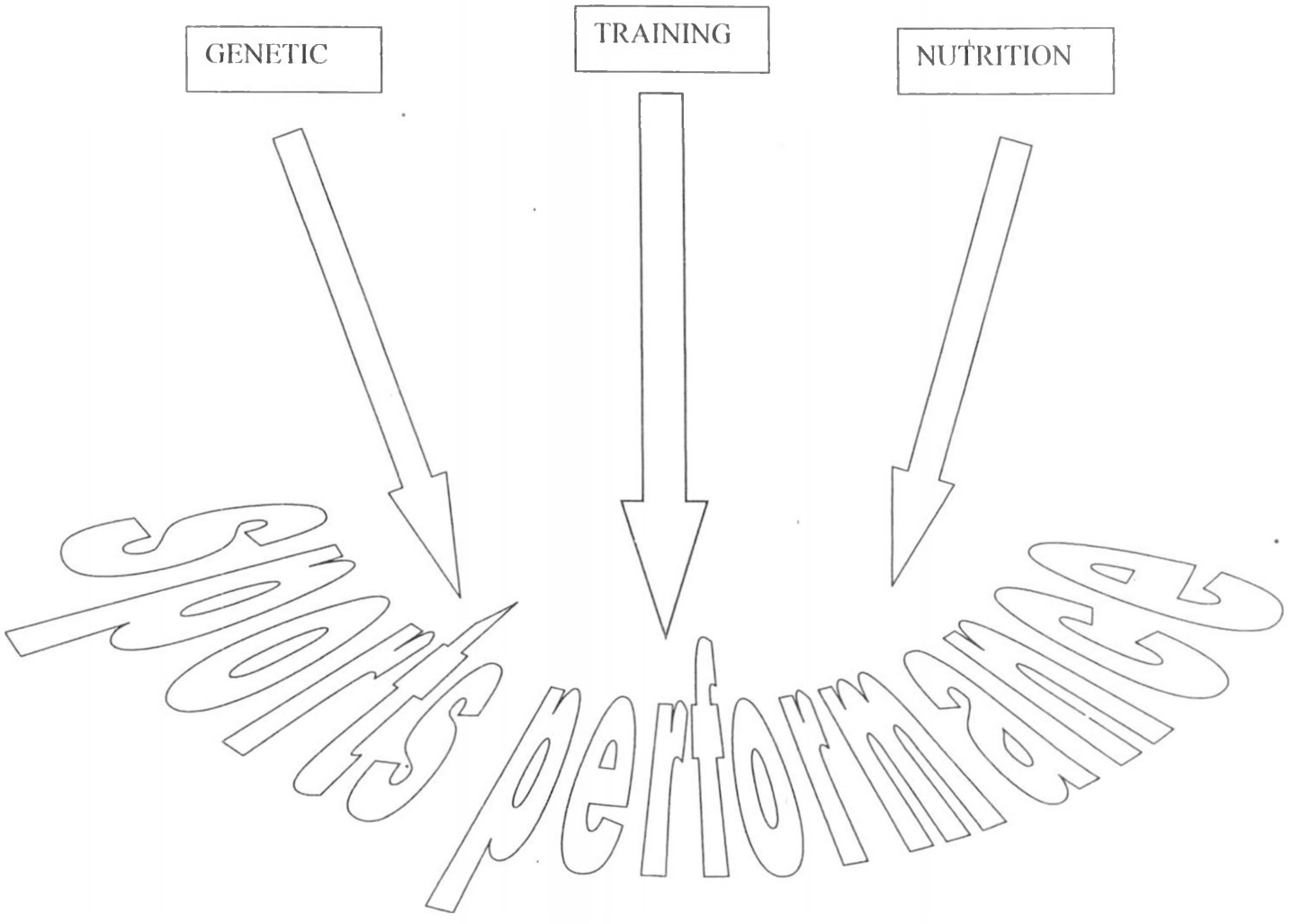
Balanced Diets for Indians ICMR 1999 (g/day) *Non Vegetarians can reduce pulses

| #Sedentary work<br>Food/raw | 7-9 yr &<br>10-12 yr G | 10-12 yr<br>Boys<br>&woman | Man # |
|---|---|---|---|
| Cereals & millets | 220 | 300 | 420 |
| Pulses | 60 | 60 | 60 |
| Roots & tubers | 200 | 100 | 200 |
| GL Vegetables | 100 | 100 | 100 |
| Other vegetables | 100 | 100 | 100 |
| Fruits | 100 | 100 | 100 |
| Milk & Milk products | 300 | 300 | 300 |
| Sugar | 25 | 20 | 25 |
| Meat fish /Egg* | 50 | 50 | 50 |
| Fats and oils | 20 | 20 | 20 |

Thus a balanced diet provides all the essential nutrients in required quantities for growth, development and health of the body. A balanced diet provides food and nutrition security and we all can work, think, act, carry out sports activities and so on. Are we getting a balanced diet ? As per the results of surveys conducted all over INDIA : NO and YES

**Tips for healthy eating**

- Eat whole grain cereals, millets and pulses.
- Eat plenty of seasonal vegetables and fruits.
- Consume green leafy vegetables
- Milk and milk products, fruits and vegetables are essential for children.
- Foods of animal origin, oil, fat and sugar are good for growing children, adolescents
- Avoid synthetic drinks/ beverages . Natural drinks are good for health . They provide antioxidants.
- Wash hands with soap before eating.

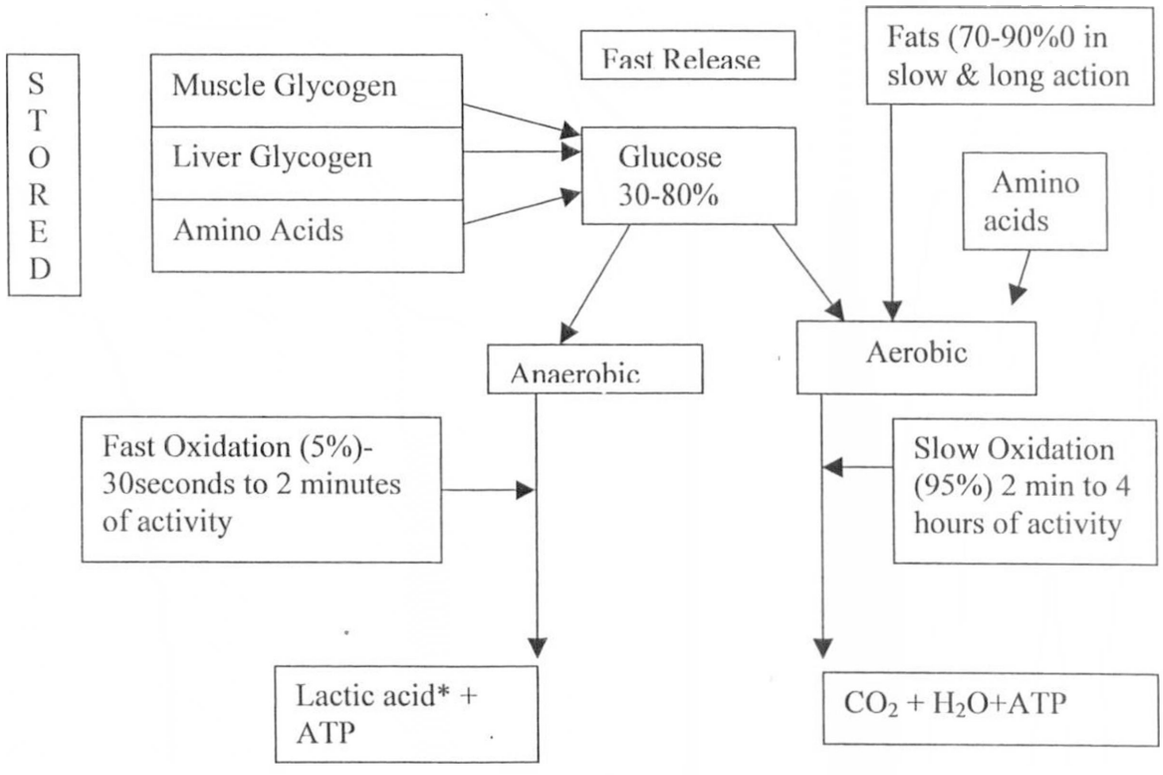


**Nutrition and Sports Activities**

Sports persons require a well balanced diet. The nutritional requirements are very similar to those of sedentary persons with certain exceptions, which depend upon their body size, age, type of sports, competition, intensity and frequency, duration of physical activities.

Energy is necessary for any sports activity. .Muscular work is an essential feature of any type of physical activity or sports. Ordinary activities like sitting standing also involve muscular work . Continuous sports activity for a long period demands high level of energy .

CHO specially glucose is a valuable source of energy as it is quickly and efficiently metabolized to produce ATP. Adenosine Tri phosphate is the energy currency of the cell. The total energy provided through diet is used for basal activities of the body (50%) like respiration heart beat ,kidney function , digestion and so on, and, for physical activities (50%).




* Accumulation leads to fatigue

** Diet high in CHO increases muscle glycogen

**Energy Yield from Oxidation of foods**

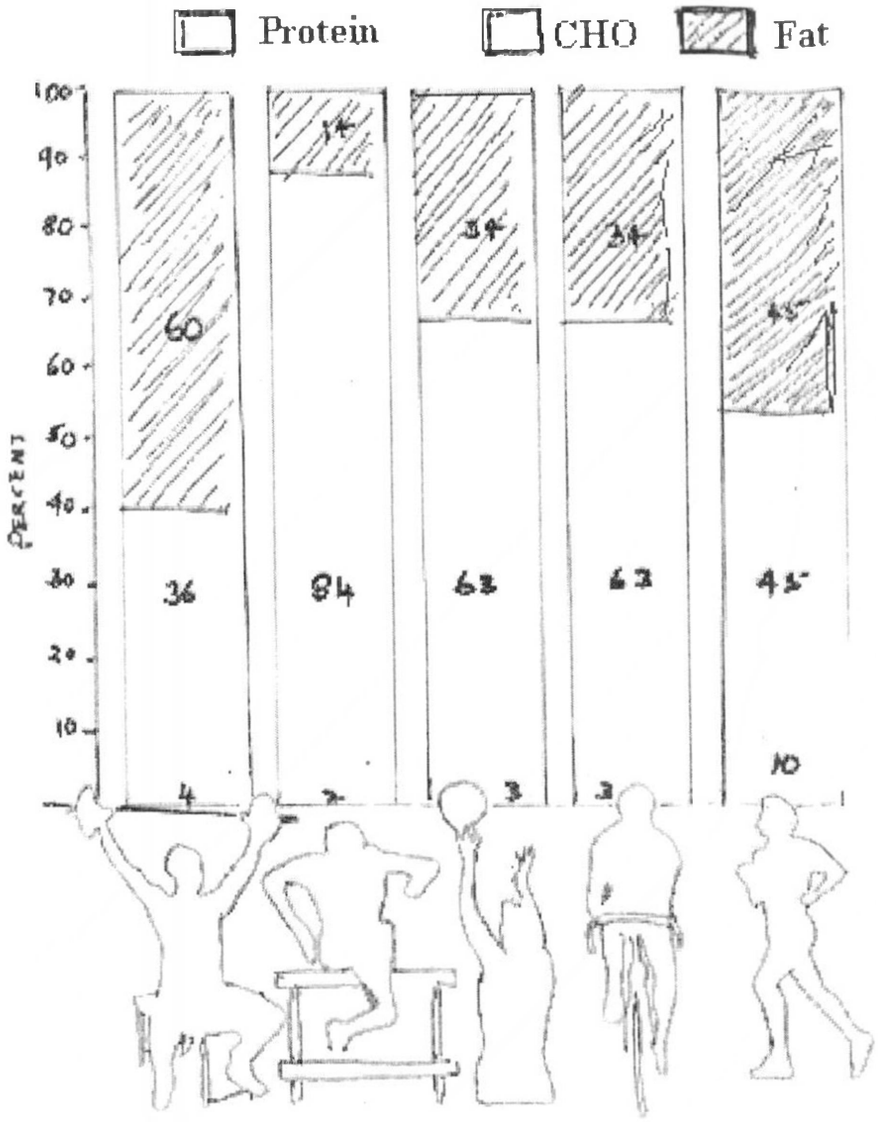
| Item | Oxygen Consumed L/g | Energy K.Cal./g |
|---|---|---|
| Starch * | 0.829 | 4.20 |
| Glucose * | 0.746 | 4.20 |
| Lipids | 2.019 | 9.46 |
| Protein | 1.010 | 4.70 |
| Lactic acid | 0.746 | 3.62 |

*** Carbohydrate- Highly efficient fuel for physical work**

**Energy system for muscle use***

| System | When in use | Activity |
|---|---|---|
| ATP | At all times | ALL types |
| Phospho-creatine | All exercises –extreme exercise | Shot put , jumping |
| Anaerobic Glycolysis | High intensity exercise -30 sec to 2 min. | 200 meter run |
| Aerobic Glycolyis | Exercise -2 min to 4-5 hours | Basket ball, swimming, jogging |
| Aerobic fat | Exercise more than few minutes – lower levels of intense exercise | Brisk walk , cycling, Long distance running |
| Aerobic Protein | Low levels of exercise –endurance exercise when CHO is low | Long distance running |

*** At any given time, more than one system works**




# ENERGY EXPENDITURE PATTERN OF DIFFERENT NUTRIENTS FOR DIFFERENT SPORTS ACTIVITIES

MAJOR SOURCE OF ENERGY - CHO

- Recommendations for training diet- Consume sufficient energy in the form of carbohydrates to maintain the stores of energy within the muscles, 500-600 g/day. (8- 10 g/kg/day) is necessary to ensure adequate glycogen re synthesis.
- Start the refueling process as soon as you can after you finish training.
- Try taking smaller but more frequent meals.

**Diet just before the competition**

Take high carbohydrate diet. Foods high in fat or protein takes longer time to digest than carbohydrates, such foods if eaten a few hours before an event, can cause indigestion nausea, vomiting.

To have relatively empty stomach during the event, the athlete should eat 2-4 hours before the competition.

Eating sugary foods such as candy and honey right before exercise does not provide quick energy.

Athletes taking part in stop-start sports, such as football, basketball, swimming and volleyball, should eat a pre-competition meal that is moderately high in carbohydrate foods, such as chapathi, potato, bread sweet potato, rice, upma but low in fat.

**Dietary recommendations during competition**

- Do not try any new food prior to competing.
- Make sure you start your competition at least with normal glycogen stones.
- Start hydrating at least 7 days before the competition to ensure you are fully hydrated prior to competition.
- Alcohol consumption, coffee, tea and unusual foods should be avoided.
- Never go for competition on empty stomach.
- Try to meditate and relax on the day of competition.
- If competing throughout the day in hot days, try to take fluids and carbohydrate rich food, between the bouts of competition for e.g.., Banana, biscuits *etc*.

**Nutrition after exercise/Sports**

The amount and timing of carbohydrates consumed following an athletic event are very important.Sports persons should drink plenty of water or fruit juice as soon as possible for rehydration and to replenish glycogen stores.

The body is most efficient at absorbing and storing glycogen during the first 4-5 hrs after exercise. Foods and fluids to be eaten after competition include good sources of carbohydrates such as roti, iddli, upma, bread, biscuits, rusks, fruits, fruit juices like, lemon juice, carrot juice, tomato, juice, orange juice.

**A sample diet for a day - sportsperson –items g**

| | | | |
|---|---|---|---|
| Wheat Flour | 300 | potato | 100 |
| Rice | 150 | tomato | 100 |
| Bread | 120 | onion | 100 |
| Biscuits | 4-8 nos | lemon | one |
| Porridge | 50 | milk | 500 ml |
| Pulses | 80 | | |
| Vegetables | 200 | | |
| Fruits Seasonal | 300 | | |
| Sugar | 100 | | |
| Cooking oil | 30 ml | | |
| Jam | 40 | | |

Calories : 4700, fat 90, carbohydrate: 842

**Snap shot - dietary recommendations for sports persons**

- consume balanced diet. avoid junk foods

- Drinks are necessary if it is a for long duration –Drink freely before 2 hours of activity. Then consume 1- 2 cups of sports drink about 15 min. before the event . This is called hyper hydration. Consume 1 to 1 ½ cups for every hour if the activity is more than one hour of activity

- Electrolyte replacement during exercise is not necessary if it is less than one hour. However small quantity of drink maybe taken. Coffee or tea or any stimulating drink should not be recommended.

- Carbohydrate loading is essential to increase the muscle glycogen by 50-85% . High CHO food should be taken three days before the event.

- A light meal before 2 hours of the event is necessary .

# ORIGAMI

**A.V.Sastry,**
**520, II Cross,**
**Jayanagar,**
**Kolar 563101**

Since about the first century AD the time when paper is believed to have been invented in China people have been folding it into different shapes. The Chinese developed some simple forms some of which have survived even to this day. When the secret of paper was carried in the sixth century by the Buddhist monks to Japan it was soon integrated into their culture. Paper was used in architecture and in the many rituals of everyday Japanese life and of the Shinto religion. The word for "paper" kami, is a homonym for the word "spirit" or "god"

The Japanese transmitted the designs through oral tradition because nothing was written down, only the simplest designs were kept. The first written instructions appeared in 1797 with the publication Senbazuru Orikata (one thousand folded cranes). The crane was considered a sacred bird in Japan. It was a Japanese custom that if a person folded 1000 cranes, they would be granted one wish. Origami became a very popular form of art as shown by the well-known Japanese woodblock print that was made in 1819 entitled "A Magician Turns Sheets of Birds". This print shows birds being created from pieces of paper.

The Kan No Mado ( Window on Midwinter), a collection of traditional Japanese figures was published as a part of the encyclopedia of Japanese culture in 1845. It included a collection of approximately 150 origami models. This book introduced the model of the frog which is a very well known model even today. With the publication of both these books, the folding of origami became recreation in Japan. Not only were the Japanese folding paper, but the Moors, who were from Africa, brought paperfolding with them to Spain when they invaded that country in the eighth century. The Moors used paperfolding to create geometric figures because their religion prohibited them from creating animal forms. From Spain it spread to South America. As trade routes were developed, the art of origami was introduced to Europe and later the United States.

Akira Yoshizawa of Japan is one of the master paperfolders in the world. He is considered the "father of modern origami" because of his creative paperfolding. He, along with American Sam Randlett is the creator of lines and arrows that are used in paper folding instructions. Exhibitions of his work in 1950 inspired the westerners to fold and, by the mid 1960's paper folding was developing as quickly in the west as in Japan. He also developed a set of symbols and terms that are used worldwide in the written instructions of origami.

Today , master paper folders can be found in many places in the world. New and improved folding techniques have produced models that would have astounded the ancients.

Where once it was considered a feat to fold a representational insect that gave an impression of a segmented body with multiple legs, anatomically correct insects is now considered to be a commonplace and the feat is to create insects of a recognizable species. The interest in origami continues to increase today. Just as the ancient Japanese found useful purposes for their origami models, so do we today. Origami will also be a part of our future as we look toward the millennium. The origami crane has become a global peace symbol.

**What is Origami?**

What is origami? Does origami refer to folding paper, or does it include other mediums, like sheet metal or edible paper-thin pancakes? Is origami a craft or an art? Can it be both? Should the definition of origami allow some gluing and cutting, as long as the origami model is arrived at mainly through folding? Joseph Wu defined origami as follows:

> **Origami is a form of visual / sculptural representation that is defined primarily by the folding of the medium (usually paper).**

You may have your own ideas on this subject. As for the word itself, it is commonly known that the word is Japanese in origin; *oru* means "to fold", and *kami* means "paper".

In modern Origami art only one sheet of plain paper is used. The paper is available at stationery and toy shops. It is square and colored on one side only. For special artistic work, however, paper and color are especially chosen to suit a particular theme. Here the paper may take many shapes, rectangular, circular, semi-circular etc.

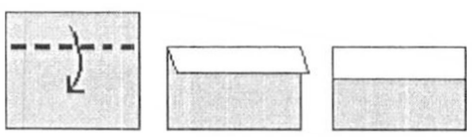
Origami is useful in many aspects of daily living such as interior decorations and as fashion accessories. In the field of packaging design, Origami has been applied to the development of practical and attractive paper boxes, cartons and wrappings.

You may have your own ideas on this subject. As for the word itself, it is commonly known that the word is Japanese in origin; *oru* means "to fold", and *kami* means "paper". In modern Origami art only one sheet of plain paper is used. The paper is available at stationery and toy shops. It is square and colored on one side only. For special artistic work, however, paper and color are especially chosen to suit a particular theme. Here the paper may take many shapes, rectangular, circular, semi-circular etc. Origami is useful in many aspects of daily living such as interior decorations and as fashion accessories. In the field of packaging design, Origami has been applied to the development of practical and attractive paper boxes, cartons and wrappings.

**Basic Folds**

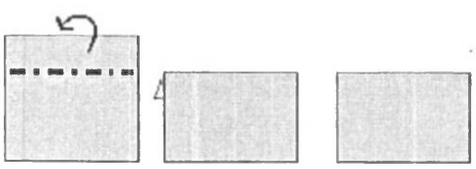
Here are some of the basic techniques for Origami. It may not be easy to understand how to do one of the following folds at once. After having folded some models it becomes easy. It's all a question of practise.

**Valley Fold**



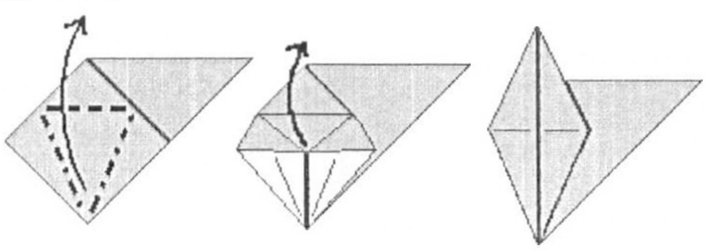
The valley fold is formed by folding the paper toward oneself. An arrow shows where to fold the piece of paper to.
Symbol: dashed line

**Mountain Fold**



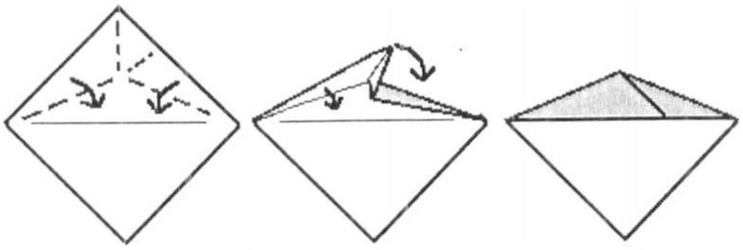
The mountain fold is formed by folding the paper away from oneself.
Symbol: alternating dashed and dotted line

**Petal Fold**



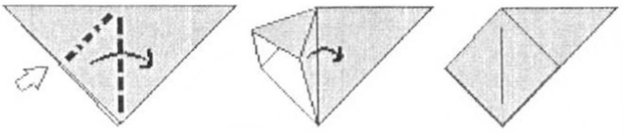
The petal fold lifts a point and brings it upwards so that the two edges of the point lie together. It is best to prefold both layers of paper along the shown valley and mountain folds before making the petal fold.
The best example for this fold is the birdbase

**Rabbit Ear Fold**



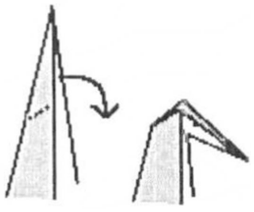
Prefold along the three valley folds first. Then fold the two sides down to the baseline (see arrows). Fold the top point to one side to make the mountain fold. (Take care that you fold the top point to the right side where the mountain fold is set.)

**Squash Fold**



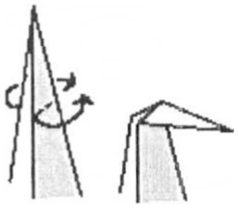
Prefold both sheets of paper along the valley and mountain fold. Then open the model, fold one layer of paper along the valley fold and flatten the model using the mountain fold.
The big white arrow tells you to open the model.

**(Inside) Reverse Fold**



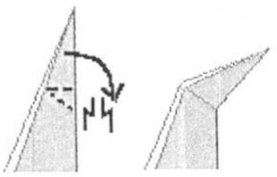
Prefold both sheets of paper in both directions (mountain and valley). Then open the model a little bit and bring the top point down so that the mountain fold edge becomes a valley fold edge.

**Outside Reverse Fold**



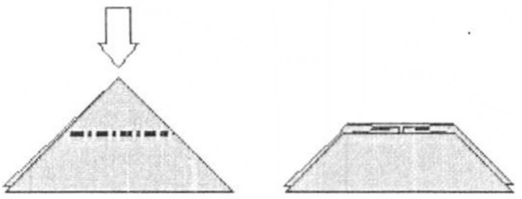
It is similar to the inside reverse fold except the layers of the paper have to be wrapped around outside the point.

**Crimp Fold**



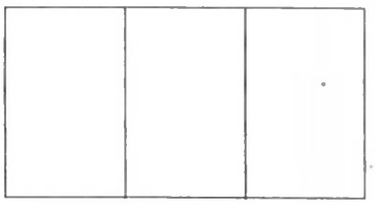
A crimp is used as a way of incorporating two reverse folds to change the direction of a flap or point. In most cases it is easiest just to make two reverse folds one after the other (precrease both folds before).
The lines next to the image should show you how the layers lie after folding.

**Sink Fold**

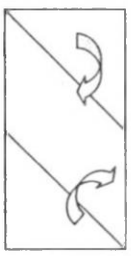


The sink fold is a method of blunting a point that has no open edges. The fold should first be precreased. Then carefully open the model and tuck the point inside. Flatten the model afterwards along existing creases.

**How to make a cube**



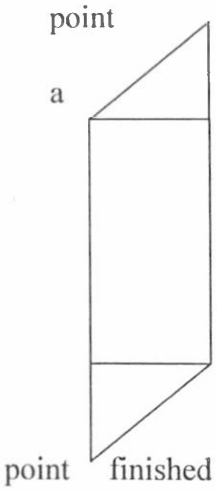
Mountain fold or valley fold in thirds as shown.



Valley fold with white side up

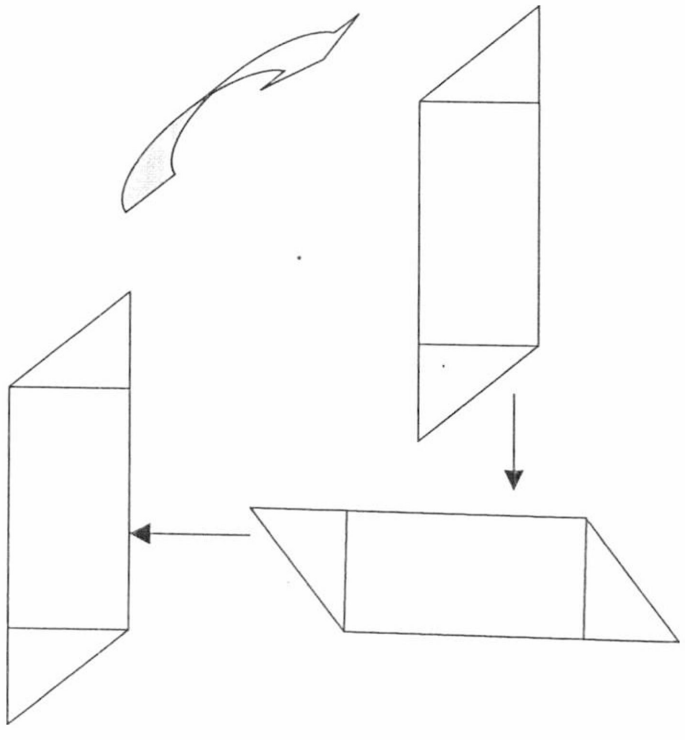
Crease as shown

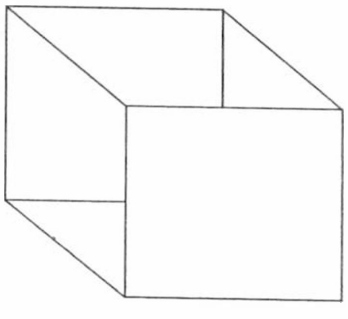
turn over




finished unit A

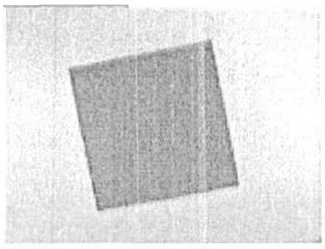
Make 6 units of A and assemble as shown.



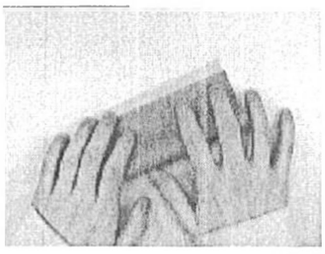


finished cube

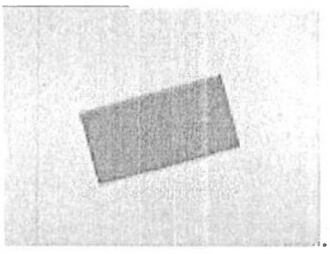
**How to make an origami crane**



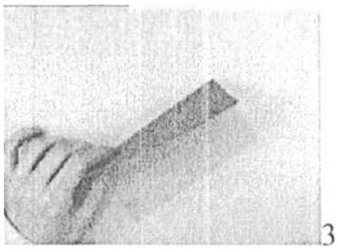
1. Start with a perfectly square sheet of paper. Paper made specifically for origami can be found at most craft stores. It is usually colored only on one side. A sheet that was colored on both sides can also be used..



2. Begin by folding one edge to meet to other, with the colored side outward...

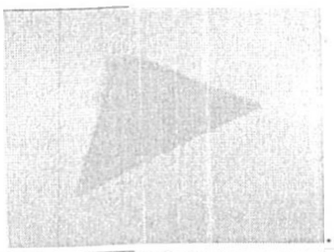


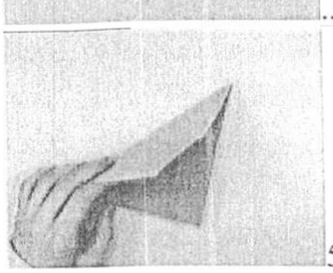
...to get this.

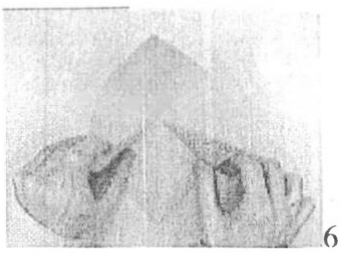


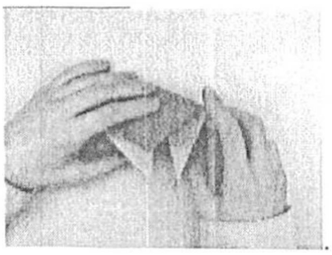
3. Open up the paper and lay it flat.Now repeat step 2 in the other direction,and open up it up again.

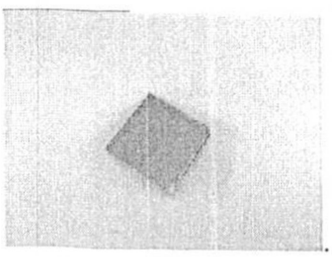
4. Fold it diagonally with the white side out (pink here).Line it up corner to corner...

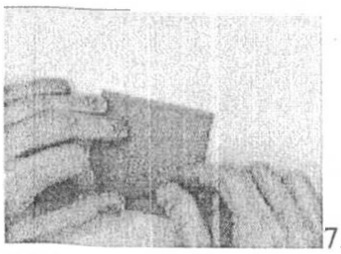
 ...to get this.

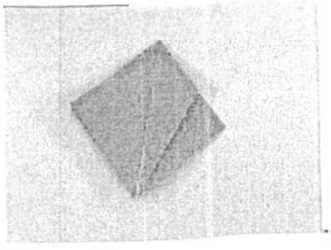
 5. Open up the paper, repeat step 4 in the other direction, and open up the paper again.

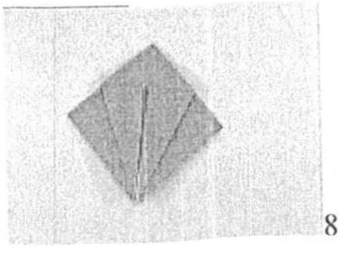
 6. Lay the paper with the white side up. (pink here) Bring in the side corners, while bringing the top corner down...

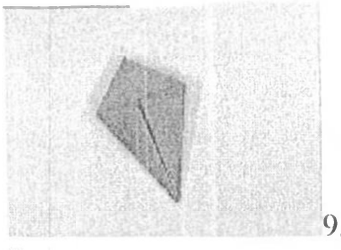
 ...like this...

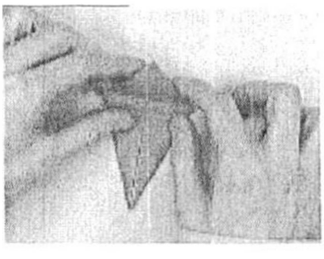
 ...to get this.

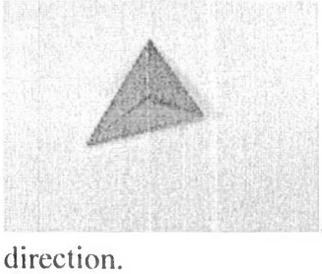
 7. With the open side pointing towards the left in this picture, fold one corner of the square so that the edge is lined up with the center line...

 ...to get this.

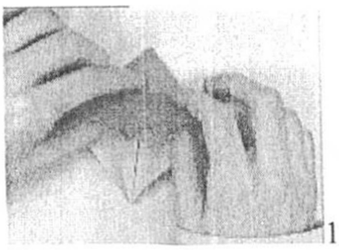
 8. Repeat step 7 with the other flap.

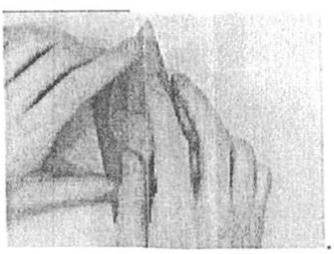
 9. Flip the paper over and repeat step 7 for the other two flaps.

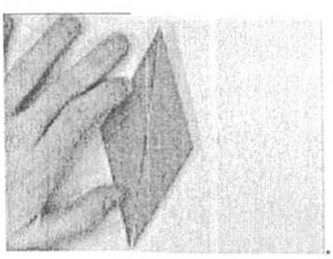
 10. Fold the top flap down and crease hard...

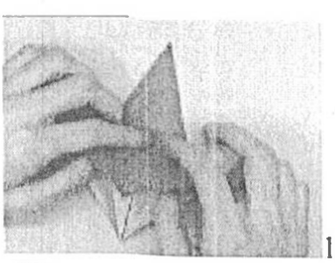
 ...to get this. Now fold it the same way in the opposite direction.

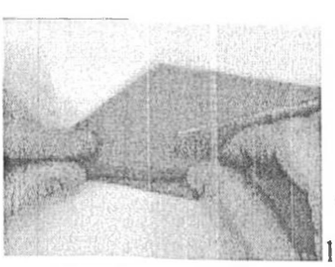
11. Open up one side, and lay it flat.

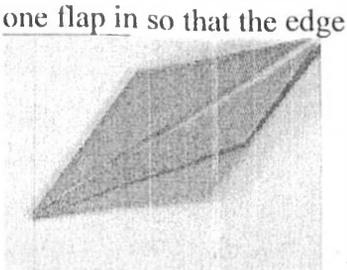
 12. Lift the top flap on the open end (the lower end in this picture) and fold it upwards, bringing in the sides...

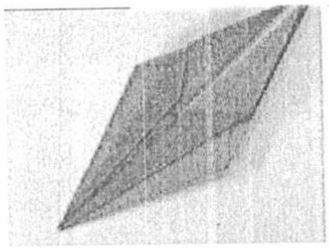
 ...like this...

 ... and lay flat to get this.

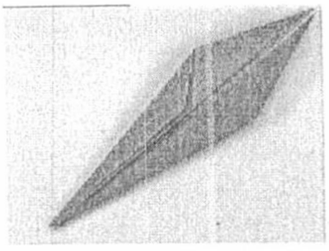
 13. Flip the paper over and repeat steps 11 & 12for the other side...

 14. With the open end towards the left in the picture, fold in one flap in so that the edge lines up with the center line...

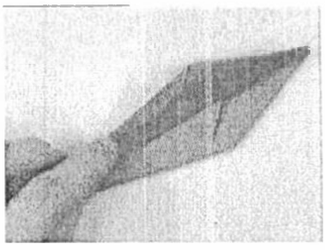
 ...to get this.



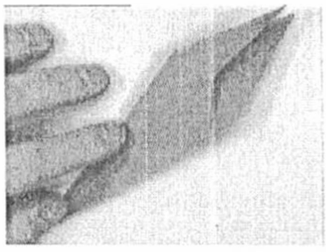
15. Repeat step 14 for the other flap.



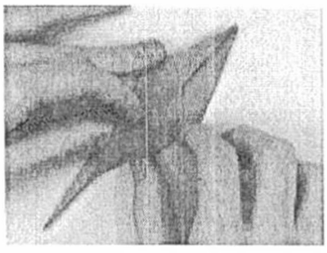
16. Flip the paper over and repeat steps 14 & 15 for the flaps on the other side.



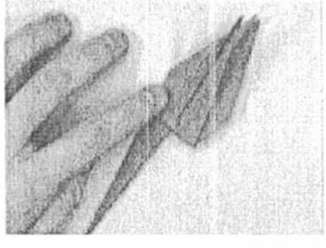
17. Fold over one side, like this...



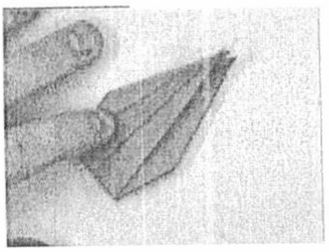
... and lay flat to get this.



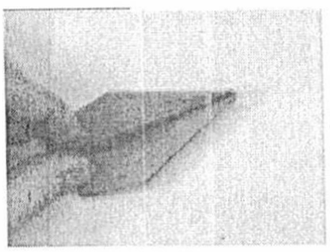
18. Fold up the top flap on the open end, so that the tip of the lower flap reaches the tip of upper flap...



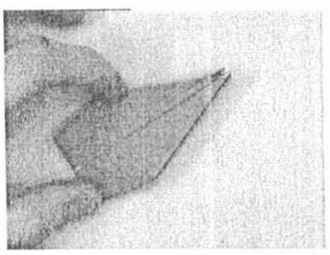
...like this.



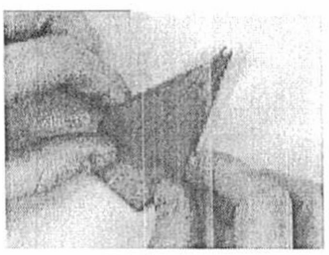
19. Fold two of the flaps over and repeat step 18 for the other lower flap.



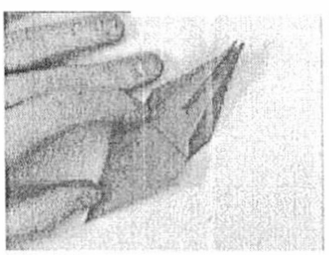
20. Fold one flap over and lay flat...



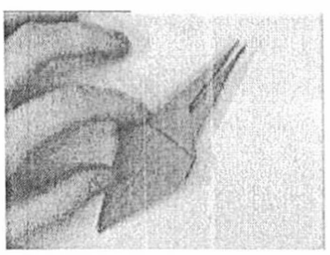
...to get this.



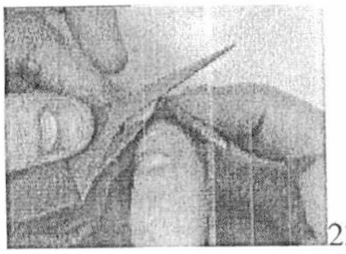
21. Fold the top flap down...

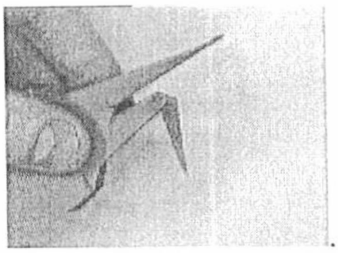


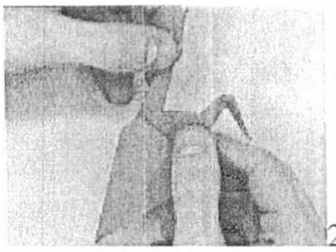
...to get this.

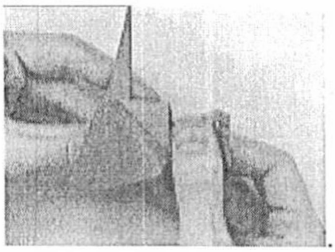


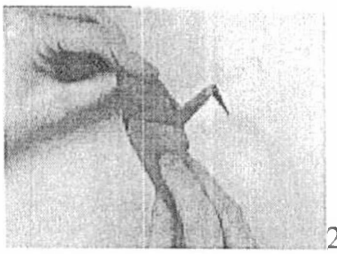
22. Flip the paper over and repeat step 21 for the other side.

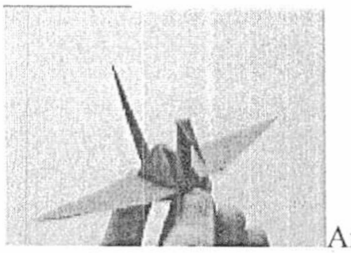

23. Invert fold one of the upper tips like this...


...to form the head.


24. Pull back the other tip like this..


...to form the tail.


25. Gently pull the wings apart to form the body.


And now it is complete!

References:
www.origami.com
www.monkey.org/~aidan/origami/crane/

# EYE CARE

**Dr H.R.Manikarnika,**
**Principal**
**Health and Family Welfare Centre,**
**Mysore**

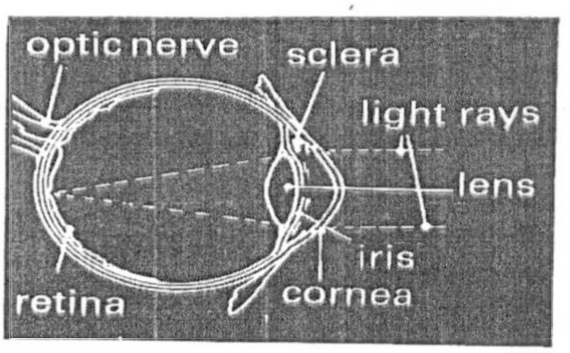
"Oh, something is wrong with my eye!" We have all said this at some time. How uncomfortable it can be! Fortunately, many common eye (ocular) disorders disappear without treatment or can be managed by self-treating. Various products--from artificial tears and ointments to ocular decongestants--are available over-the- counter (OTC). These products can help with dryness, itching, or excessive watering of the eye. However, a word of caution: in some instances, what may seem like a minor eye problem may lead to a severe, potentially blinding condition.

Many safe and effective OTC products for eye disorders are available for self-treatment. Two important factors to remember when considering self-treatment are: (1) if the problem appears to involve the eyeball itself, you should consult a physician immediately; and (2) if you use an OTC eye care product for 72 hours without improvement of the condition being treated or the condition worsens, you also should see a doctor immediately.

To self-treat common ocular disorders with OTC eye care products, viewers should understand: (1) the structure of the eye; (2) the cause of the disorder; (3) which disorders are safe to self- treat and which should be referred to a physician; (4) the types of OTC eye care products that are available and the disorders in which they are useful.

## What is the structure of the eye?

The eyes are complex sensory organs. They are designed to optimize vision under conditions of varying light. Their location, on the outside of the face, makes them susceptible to trauma, environmental chemicals and particles, and infectious agents. The eyelids are the major protective mechanism for the eye. The eye consists of the eyeball, the upper and lower eyelids, and the conjunctivas.



The eyeball consists of a clear, transparent dome at the front (the cornea) that is surrounded by the white of the eyeball (the sclera). The iris of the eye is the circular, colored portion within the eyeball and behind the cornea, and the pupil is the central opening within the iris. Behind the iris and pupil is the eye's lens.

The inner sides of the eyelids which touch the eyeball, are covered by a thin membrane (the palpebral conjunctiva) that produces mucus to lubricate the eye. This thin membrane folds back on itself and covers the visible sclera of the eyeball. (This continuation of the palpebral conjunctiva is called the bulbar conjunctiva.) The tissue between the skin of the eyelid and the palpebral conjunctiva is filled with glands that secrete sebum, an oily substance that provides additional lubrication for the eye. Tears are formed by the lacrimal gland in the upper, outer corner of the eye and are collected and drained by the lacrimal sac in the inner, lower corner of the eye. Natural oil for the tears is produced by tiny glands located at the edges of the eyelids.

**Which common disorders of the eye can (sometimes) be self- treated?**

**Blepharitis**: Blepharitis is a common condition that is caused by inflammation of the eyelid. It results in red, scaly, and thickened eyelids and typically some loss of the eyelashes. Blepharitis may be due to either Staphylococcus epidermidis or Staphylococcus aureus (types of bacteria), or seborrheic dermatitis (a type of skin inflammation of unknown cause), or a mixture of the two. The most common complaints are itching and burning. Blepharitis is initially treated by applying hot compresses to the affected eye, followed by an eyelid scrub. If the condition persists, you should see the doctor, who may prescribe antibiotics.

**Lice:** The eyelids can become infested with one of two different lice, the crab louse (Phthirus pubis) or the head louse (Pediculus humanus capitis). Lice in the eyelids cause symptoms and signs that are similar to those of blepharitis (red, scaly, and thickened eyelids, usually with some loss of the eyelashes). Petrolatum or a non-medicated ointment is applied to the eyelid and suffocates the lice eggs. RID, NIX, A-2000 or any other preparation that is designed for use in the hair should not be used near the eyes.

**Contact dermatitis:** Contact dermatitis is an inflammation of the skin that causes swelling, scaling, or redness of the eyelid with intense itching. This condition usually is triggered by the use of a new product (soap or make-up) or exposure to a foreign substance. If both the upper and lower eyelids are affected, the cause of the inflammation is likely to be an allergic reaction. Antihistamines that are taken by mouth can be used to treat contact dermatitis of the eyelid.

**Foreign substance:** Lint, dust, an eyelash or other foreign matter can become stuck in the eye. When the substance cannot easily be removed either with your finger, water, or an ophthalmic irrigant, a doctor should be seen.

**Thermal damage:** Thermal damage is a burn injury to eye itself. Exposure to the sun's UV radiation during outdoor activities is an example of minor ocular thermal

damage. An eye lubricant can be applied to soothe the eye. If there is no relief to the eye after 24 hours, a physician should be seen. An injury to the eye, for example, from a welder's arc, warrants the immediate attention of a doctor.

**Conjunctivitis:** Bacteria, virus, allergy or inflammation- promoting agents can cause inflammation of the palpebral and bulbar conjunctiva, also known as conjunctivitis. The inflammation causes enlargement of the blood vessels in the conjunctiva ("congestion") and causes the conjunctiva to become red ("blood-shot"). Itchy eyes may or may not accompany the inflammation. The congestion and itchiness can be treated with ocular decongestants, but the underlying cause may need treatment as well.

**Dry eye:** Dry eye is characterized by a white or mildly reddened eye combined with a sandy, gritty feeling. Unlike the name implies, dry eye is accompanied by excessive tearing. Abnormalities of the tears or the lubricants of the eye themselves are thought to reduce the effectiveness of the lubrication. The resulting inadequate lubrication stimulates an increase in the production of tears. Other factors thought to contribute to dry eye are aging and some drugs such as antihistamines, antidepressants, or diuretics (water pills). A different type of dry eye can occur when the flow of tears is reduced because of inflammation and destruction of the lacrimal glands (keratoconjunctivitis sicca). Although lubricants are effective for treating dry eye, a physician also should be consulted.

**Hordeolum:** Commonly referred to as a sty, a hordeolum is an inflammation of the glands within the eyelid. The primary sign of a hordeolum is a tender, raised nodule on the eyelid. Sometimes, the eyelid is so swollen that the eye appears to be completely shut. A hordeolum is usually caused by the same bacteria that are linked to blepharitis. Treatment usually is with hot compresses several times per day, but if the problem worsens or does not clear within a week, a physician should be seen. Antibiotics may be necessary.

**Chalazion:** A chalazion looks similar to a hordeolum. A chalazion is a raised nodule without the tenderness of a hordeolum. Like a hordeolum, it is treated with hot compresses. If the chalazion persists, a physician should be consulted.

**Amblyopia** is reduction or dimming of vision in an eye that appears to be normal.

**Floaters** appear as spots, dots or lines and affect or interrupt vision and are usually caused by bits of debris in the vitreus humor.

**Iritis** is an inflammation of the iris of the eye.

**Retinal Detachment** is the separation of the retina from the back of the eye.

**Strabismus** is crossed eyes.

**Refractive Errors**

**What are refractive errors?**

The following are the most common refractive errors, all of which affect vision and require lenses or surgery for correction or improvement:

- **astigmatism**
  This is a condition in which there is an abnormal curvature of the cornea making it no longer symmetrical. Astigmatisms cause blurred vision and eye strain and may be combined with nearsightedness or farsightedness. Eyeglasses or contact lenses are often prescribed to correct or improve the condition.
- **hypermetropia**
  Commonly known as farsightedness, hypermetropia is the most common refractive error in which an image of a distant object becomes focused behind the retina, either because the eyeball axis is too short, or because the refractive power of the object is too weak. This condition makes close objects appear out of focus and may caused blurred vision for objects at a distance, headaches, and/or eye strain. Eyeglasses or contact lenses are prescribed to correct or improve the condition.
- **myopia**
  Commonly known as nearsightedness, myopia is a condition in which, opposite of hyperopia, an image of a distant object becomes focused in front the retina, either because the eyeball axis is too long, or because the refractive power of the object is too strong. This condition makes distant objects appear out of focus and may caused blurred vision for objects at close range, headaches, and/or eye strain. Eyeglasses or contact lenses are prescribed to correct or improve the condition.
- **presbyopia**
  Another type of farsightedness, presbyopia is caused when the center of the eye lens hardens making it unable to accommodate near vision. This condition generally affects almost everyone over the age of 50 -- even those with myopia. Eyeglasses or contact lenses are prescribed to correct or improve the condition.

**What common eye conditions usually require treatment by a doctor?**

**Trauma:** Blunt trauma to the eye requires immediate evaluation by an ophthalmologist or optometrist. Trauma to the eye can activate bleeding into the eye from ruptured blood vessels or cause detachment of the retina. Both situations can seriously impair vision. Abrasion: An abrasion usually occurs when a fingernail or metallic foreign object rubs across the cornea or conjunctiva. There is a risk of bacterial or fungal contamination and infection following an eye abrasion.

**Abrasion:** An abrasion usually occurs when a fingernail or metallic foreign object rubs across the cornea or conjunctiva. There is a risk of bacterial or fungal contamination and infection following an eye abrasion.

**Chemical exposure:** Exposure of the eye to household cleaning solutions, fumes, or an actual chemical splash requires immediate evaluation by a physician, though initially it may be self- treated with water or an irrigant.

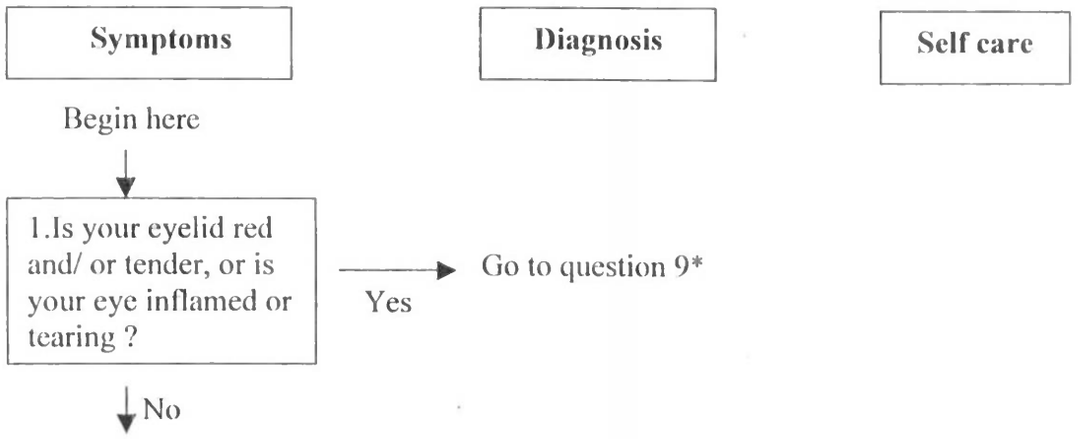
**Keratitis:** Keratitis is an inflammation of the cornea that may occur alone or simultaneously with conjunctivitis. The symptoms of keratitis include blurred vision, pain, and intolerance to light (photophobia).

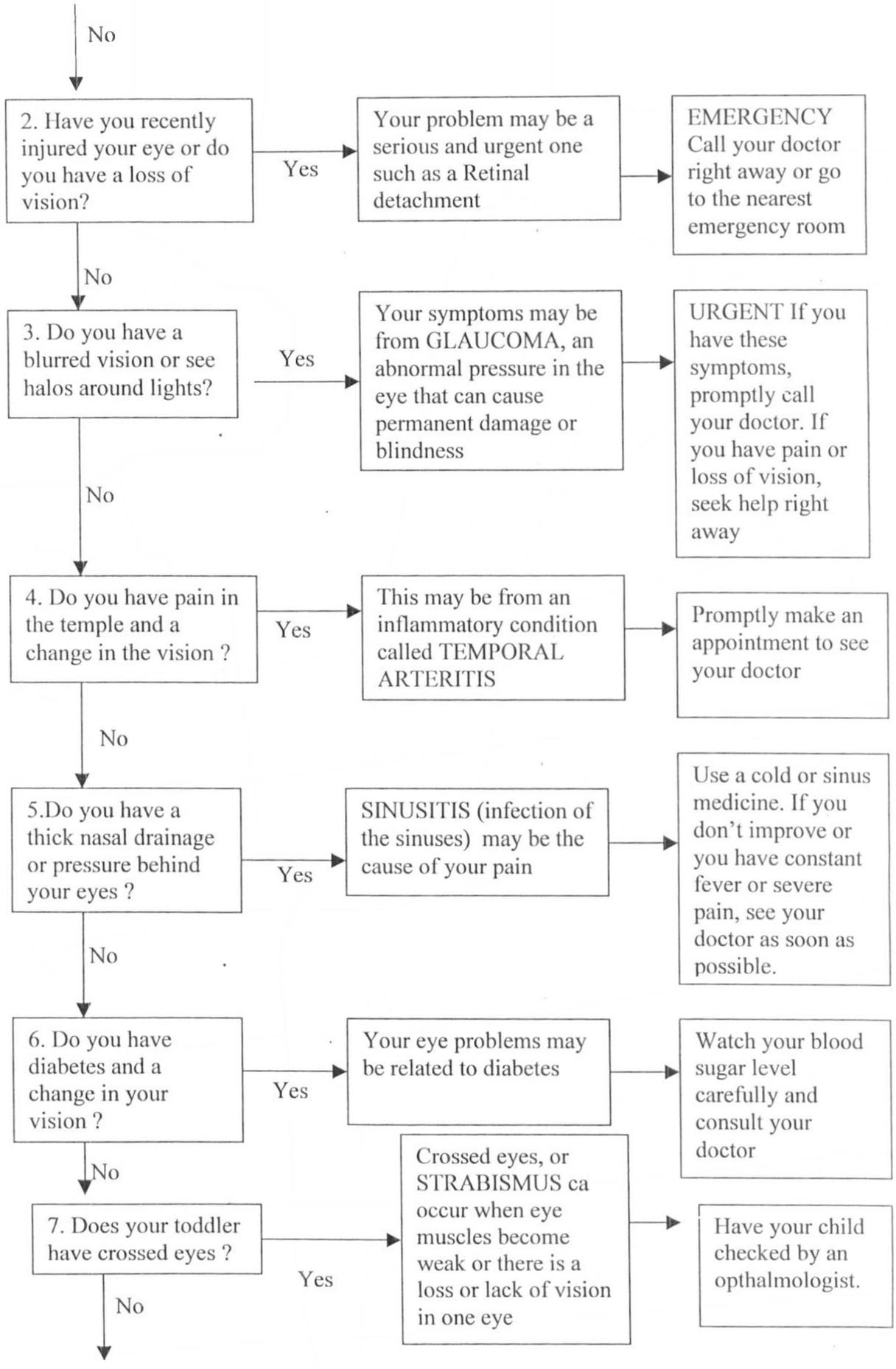
**Corneal swelling:** Corneal swelling, or edema is a condition in which fluid accumulates in the cornea. The edema causes visual disturbances such as halos or starbursts around lights. Reduced vision may or may not occur. Corneal swelling can arise as a complication of contact lenses, surgical damage to the cornea, or an inherited defect. Hyperosmotics are used to treat corneal swelling, but additional treatment by a physician may be necessary.

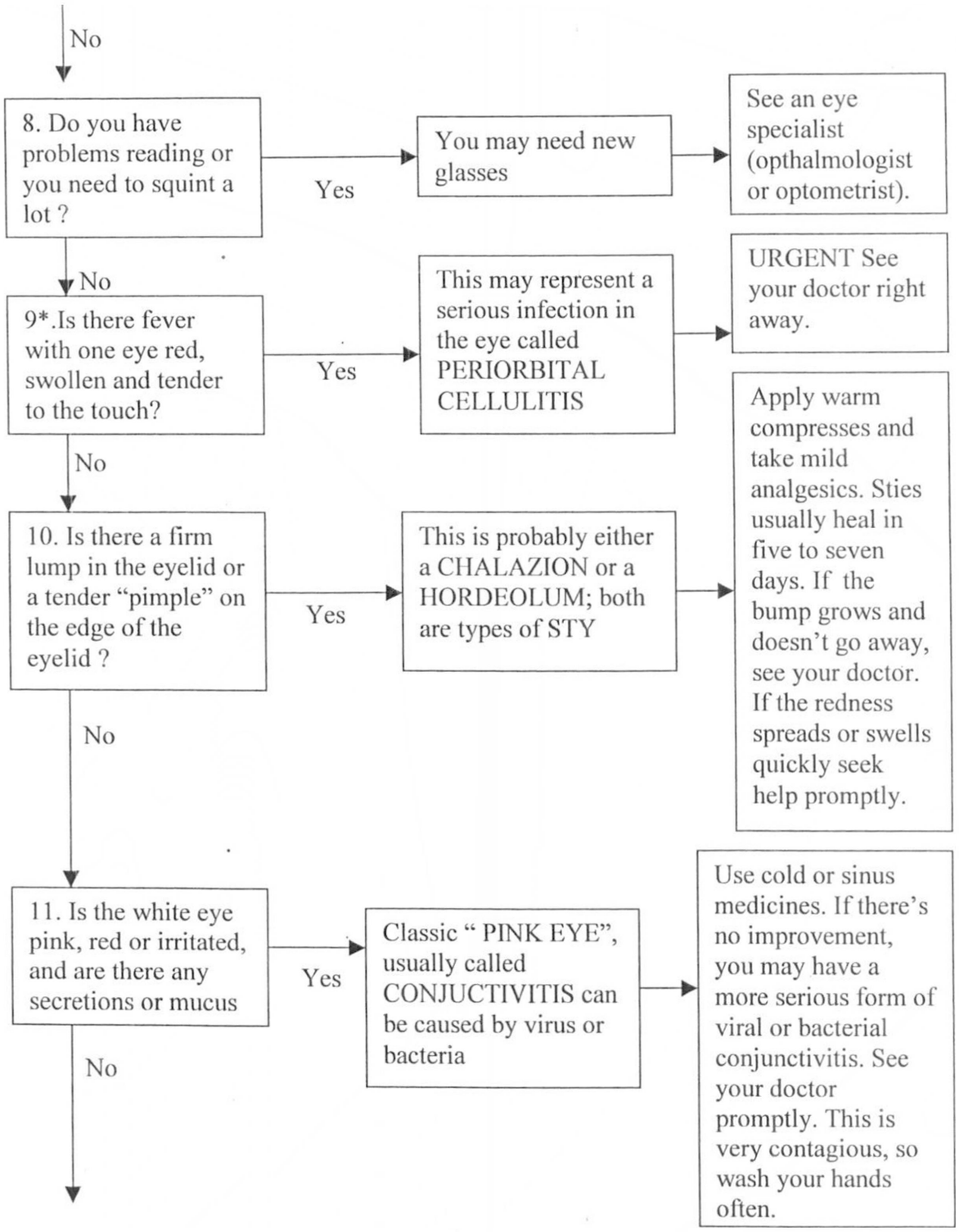
**Uveitis:** Uveitis is an inflammation of the eye structures in the uveal tract (the iris and other structures within the eye to which the iris attaches). Uveitis may occur without an obvious cause or may be due to trauma or an inflammatory disease in other parts of the body. Symptoms and signs of uveitis are similar to those of conjunctivitis and keratitis.

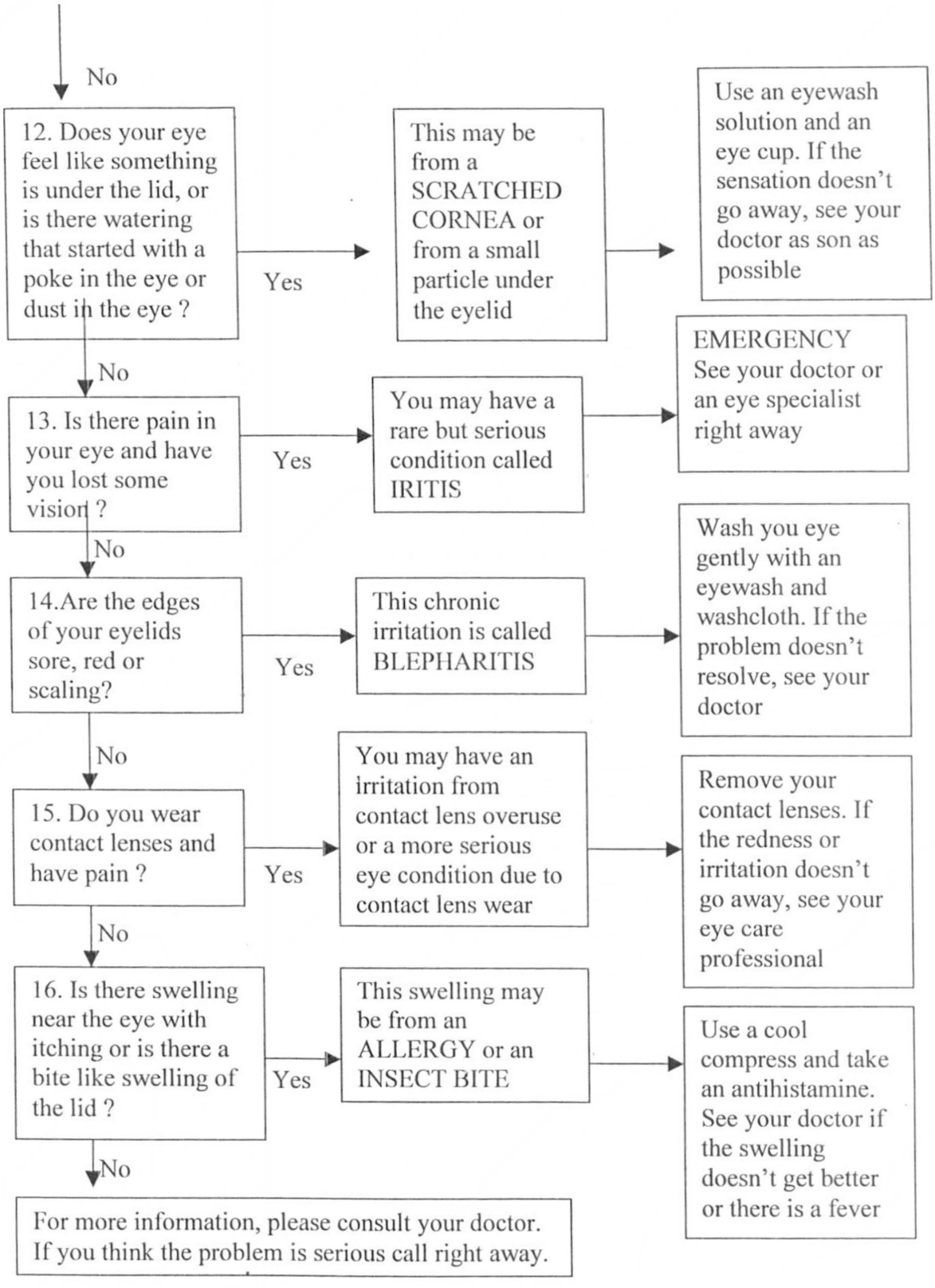
**Angle-Closure Glaucoma:** This disorder usually is triggered after an eye exam in which the pupils have been dilated. Angle- closure glaucoma is due to an obstruction of the canal system that drains fluid from the inside of the eye. As a result, fluid accumulates and the pressure within the eye increases. Patients may have a tendency to develop angle-closure glaucoma because of an anatomical defect in their eye. Common symptoms include an aching eyebrow or a headache that leads to nausea or vomitting. Angle-closure glaucoma should be suspected if symptoms develop after an agent is used to dilate the pupils for an eye exam.

Here is a summary of the symptoms diagnosis and self care as given in family.org




No
2. Have you recently injured your eye or do you have a loss of vision?
Yes
Your problem may be a serious and urgent one such as a Retinal detachment
EMERGENCY Call your doctor right away or go to the nearest emergency room
No
3. Do you have a blurred vision or see halos around lights?
Yes
Your symptoms may be from GLAUCOMA, an abnormal pressure in the eye that can cause permanent damage or blindness
URGENT If you have these symptoms, promptly call your doctor. If you have pain or loss of vision, seek help right away
No
4. Do you have pain in the temple and a change in the vision ?
Yes
This may be from an inflammatory condition called TEMPORAL ARTERITIS
Promptly make an appointment to see your doctor
No
5.Do you have a thick nasal drainage or pressure behind your eyes ?
Yes
SINUSITIS (infection of the sinuses) may be the cause of your pain
Use a cold or sinus medicine. If you don't improve or you have constant fever or severe pain, see your doctor as soon as possible.
No
6. Do you have diabetes and a change in your vision ?
Yes
Your eye problems may be related to diabetes
Watch your blood sugar level carefully and consult your doctor
No
7. Does your toddler have crossed eyes ?
Yes
Crossed eyes, or STRABISMUS ca occur when eye muscles become weak or there is a loss or lack of vision in one eye
Have your child checked by an opthalmologist.
No


No
8. Do you have problems reading or you need to squint a lot ?
Yes
You may need new glasses
See an eye specialist (opthalmologist or optometrist).
No
9*.Is there fever with one eye red, swollen and tender to the touch?
Yes
This may represent a serious infection in the eye called PERIORBITAL CELLULITIS
URGENT See your doctor right away.
No
10. Is there a firm lump in the eyelid or a tender "pimple" on the edge of the eyelid ?
Yes
This is probably either a CHALAZION or a HORDEOLUM; both are types of STY
Apply warm compresses and take mild analgesics. Sties usually heal in five to seven days. If the bump grows and doesn't go away, see your doctor. If the redness spreads or swells quickly seek help promptly.
No
11. Is the white eye pink, red or irritated, and are there any secretions or mucus
Yes
Classic " PINK EYE", usually called CONJUCTIVITIS can be caused by virus or bacteria
Use cold or sinus medicines. If there's no improvement, you may have a more serious form of viral or bacterial conjunctivitis. See your doctor promptly. This is very contagious, so wash your hands often.
No




***Protect your eyes : Preserve sight. Eat foods rich in Vitamin A. Donate your eyes and give sight to the needy.***

## OPINIONS OF STUDENTS

**Malavika, VIA, DMS, Mysore.**

I am here to express my opinion about our Summer Science Camp. We have been enjoying every millisecond of the camp. Some liked clay modeling and some liked origami, but I liked the lectures, especially the ones on Tsunami and Eye Care.

We had the greatest time at the Karanji lake and Gokul Farm. This time we had other schools like Vijaya Vittala Vidyashala, Rotary West and Pushkarni.

During Origami sessions, each moment was exciting for we were made to do great crafts in 2 days. I really enjoyed the camp and this is the best camp I have attended and ever seen!. I don't like to leave the camp at all!.
I thank ma'am P.R.Lalitha for conducting the camp and to make it successful.

I also thank the other teachers who taught us so many things.

Thank you and God Bless all of us.

**Bhoomica VIII Std, Vijaya Vittala Vidyashala, Mysore.**

I am Bhoomica of VIII Std, Vijaya Vittala Vidyashala, Mysore. I deem it a pleasure to express our sincere thanks to all the dignitaries, respected faculty of RIE who arranged this very useful Summer Science Camp to all of us.

I have attended summer camps previously but I think the best is the one I have attended now and feel this one is very precious and useful.

Not only did we learn different aspects of general science we also learnt about the different sections of science like Ornithology, Zoology, Herpetology, Chemistry and Botany. Other than this mathematics, art, craft and origami gave us a wonderful experience. In this camp we all have learnt about use of origami in zoology from Mr. J. Srinivas of Natural History Museum, in Maths from Mr. A.V.Sastry of Kolar and in science from Mr. Prabhu Mutt of KRVP, Bangalore. Madam Saraswathi from University of Mysore taught us about Nutrition even during sports. Sri Aradhya from SJCE trained us on concentration, mind relaxation and memory which will be helpful for our studies. Mr. Somashekhar from Mysore Zoo made us aware of the animals in the zoo, their habitat and the importance of conservation of the environment.

Mr. Shyam uncle gave a good demonstration on snakes. Dr. C.Srikantappa, geologist gave a thorough explanation about Tsunami, the tragedy that took place on 26/12/2004. Mr. K.B. Sadanand gave a slide show on birds and gave us training in identification of birds when we went to the Karanji Lake, the heritage sight. Sir, Kulkarni of RIE taught us to build an aquarium and clay modeling. Madam P.R.Lalitha, took us to Gokul farm along with other faculty to make us aware about vermicomposting and how to use it for improving the greenery. We did many experiments with the guidance of Dr. Prakash and Mr. Chandrashekar.

Today Dr. Manikarnika let us know about eye care, eye injuries and eye donation. She conducted the vision test too. We were taken on a tour of the Science Park which has a number of gadgets based on principles of science.

We are all grateful to all the faculty who came from different places for our sake and given us ample knowledge. I thank my friends who are accompanying me and at last, my opinion is that the Summer Camp should be continued in the future too.

At last I thank my school for giving me an opportunity to participate in this Summer Science Camp.