



eklavya

# internship report

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INSTITUTE FOR EDUCATIONAL RESEARCH & INNOVATIVE ACTION

## CERTIFICATE OF INTERNSHIP PARTICIPATION

This is to certify that **Amol Pakhale** student of **Product Design, IIT BOMBAY** successfully completed his internship as a part of Academic purpose in our organization from **28<sup>th</sup> May'2013** to **30<sup>th</sup> June '2013**.

During this period he worked on following projects:

- Book illustrations for “Core of Economics”
- Product Redesigning of “Hands-on Science Kit”

During his tenure at this organization, he was found to be sincere and meticulous in his work.

We wish him success in his endeavours.



Rajesh Khindri  
Executive Officer

DATE: 30<sup>th</sup> June'2013  
BHOPAL

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Fig.1:Background of internship

## Background of ineterntship

When I was doing my primary education a team of few people used to come in my school and arrange sessions for drawing, art & craft, stories and other curricular activities. That time I wanted to know that whom are they and from where they came.



Fig.2:eklavya

# Eklavya

## An introduction...

Since the last three decades and more, Eklavya has been striving to translate this dream into a lived reality for all children. Working towards the goal of social change through meaningful education, it conducts researches and evolves curricular models at the micro level and attempts to implement them in the mainstream system to bring about change in the school education system in India. Since my childhood I had touch with this organization through my schools and here in IDC I got to know more about this organization from Prof. Raja Mohanty. So my past willingness to work with this organization becomes true through this internship programme. Eklavya was set up in 1982 as a non-government registered society. From the onset, it took up the academic responsibilities of the landmark Hoshangabad Science Teaching Programme (HSTP), then being jointly run by

the state government and two voluntary organizations, Kishore Bharati and Friends Rural Centre. Alongside, it developed and implemented the innovative Social Science Teaching Programme and the Primary Education Programme (PRASHIKA) in the government schools of Madhya Pradesh. More recently it worked with the National Council of Educational Research and Internship (NCERT) in developing the National Curriculum Framework (NCF) 2005 and the syllabuses and textbooks based on the NCF.

Eklavya continues to actively seed and develop academic programmes for curricular change in elementary education, at the micro level, and mainstream them through government and non-government agencies. It has now initiated work in curricular research and material development in language and math in the primary stages and science and social sciences in the high school stages. This work of curricular critique, research and material development fuels its ongoing engagements with the State Councils of Educational Research and Internship (SCERTs) of Bihar, Chhattisgarh, Rajasthan, Kerala and Andhra Pradesh in providing them academic resource support in developing curricula and textbooks in various subject areas. Teacher professional development is another area that Eklavya is engaged with through research, material development and conducting teacher capacity building workshops.

Eklavya also works with the community in about 100 villages in five districts of Madhya Pradesh to run learning centres (Shiksha Protsahan Kendras) for first generation school-goers. This attempt to enhance community involvement in education and build linkages with the government schools to demand quality and efficiency. In addition, 70 libraries in government middle schools spread over 6 districts in Madhya Pradesh try to entrust the ownership and management of the libraries in the hands of children. Regular reading-writing activities in the libraries are also positively impact the learning of language and other subjects in children. (Eklavya introduction n.d.)

# “Hands on science” science kit project

‘Hands on science’ is a project where set of laboratory equipments which covers all the experiments involved till 10<sup>th</sup> class. The aim is to accommodate all the laboratory equipments within a compact box, which can be easily available for rural areas and small educational kiosks. And it should be lowest at its price.

**Challenge** is to optimize the space between science equipments and making kit more undisturbed and aesthetically appealing and also to resolve issues which are faced by the users.

## Target users

The main target users of this mass education program are students and the teachers, student and teacher mainly from the rural and sub urban area of India, mainly who don't get lot of facilities and infrastructure services. My challenge was to overcome all the situations and be clear and short as possible. Eklavya with many branches in all over India is there to motivate the Indian population within the next two decades and provide education, intervention and training.



Fig.3:hands on science

## Scope & Limitations

- The die of the box is already done, So that we can't change the whole design of the box.
- Equipments are optimized at their maximum.
- Building a box more aesthetically appealing.
- Can manage more equipment on the top portion of the box.
- Can reduce the labor cost.

We can't change the equipment available in the market already they are more compact ones.

## Inputs

- Good equipment should visible as their need.
- Stacking of tools as per their group / use / subjects.

Pliers are falling while closing the box.

Image board

Fig.4:Image board of science kit



[http://www.flipkart.com/btwin-tool-box-repair-kit/p/itmcdnasrnzhcxez?pid=TLTDCJF5NBJHPN7W&cmpid=content\\_tool-kit\\_8965229628\\_gmc\\_pla&tgi=sem,1,G,9226359,g,search,,19319548220,1o2,,,c,,,&gclid=CITasZj5urgCFelb4godE2cAmQ](http://www.flipkart.com/btwin-tool-box-repair-kit/p/itmcdnasrnzhcxez?pid=TLTDCJF5NBJHPN7W&cmpid=content_tool-kit_8965229628_gmc_pla&tgi=sem,1,G,9226359,g,search,,19319548220,1o2,,,c,,,&gclid=CITasZj5urgCFelb4godE2cAmQ)



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<http://cdn.gajitz.com/wp-content/uploads/2010/05/gilbert-atomic-energy-lab.jpg>



<http://www.earthexplorertoys.com/blog/wp-content/uploads/2012/10/Super-Science-Kit-Earth-Explorer-Toys.jpg>



<http://www.fuelcellstore.com/en/pc/catalog/K0350EScienceKitBasicthumb.jpg>



<http://www.kidlantis.com/wp-content/uploads/2011/03/primary-science-kit.jpg>

Fig.5:Optical box



Fig.6:Concepts for optical box

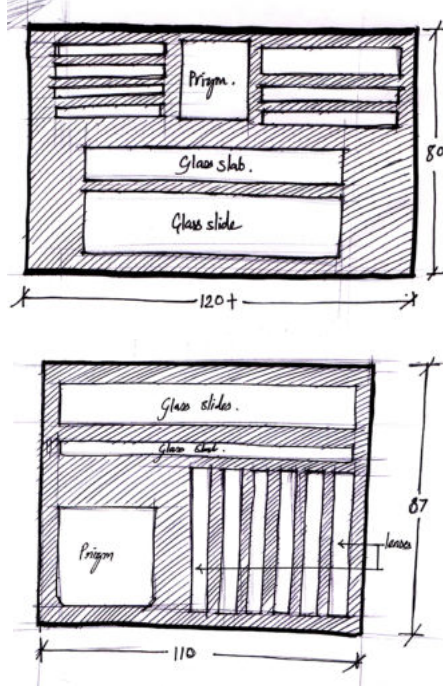


Fig.8:Drawing of optical box

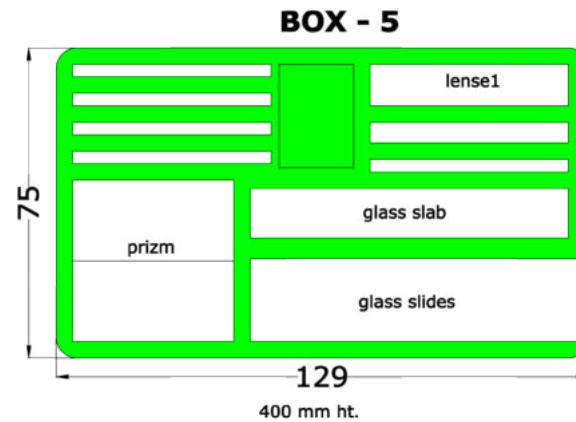
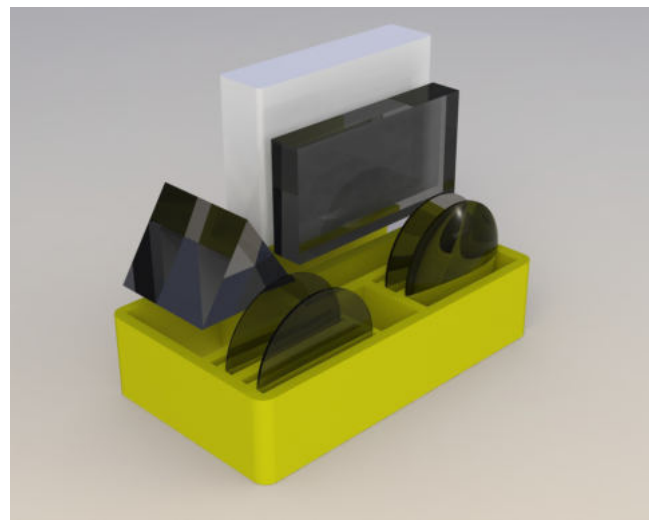


Fig.7:Arrangement of optical box



## Optical box

To optimize the space of optical box this contains following things

S.no	Apparatus	Quantity
1	Prism	1
2	Glass slab	1
3	Glass slides	12
4	Lenses	7

## Problems

- All equipments are dumped in a box and it is very hard to sort out.
- Sometimes optical apparatus get damage during travelling.

## Scope and limitations

- All apparatus can be arranged in such a manner so that we can locate all the things very easily.
- Whole box should have visual attraction.
- Whole arrangement would be as optimize as possible.
- Should be Leak proof – H<sub>2</sub>SO<sub>4</sub> and caustic soda.

China foam can be used as a base material for making slots

## Exploration & Concept

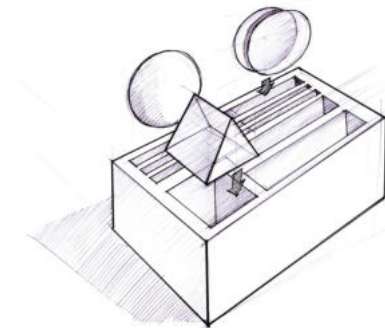


Fig.9:Sticker design for box



## Sticker design

It is very hard to arrange all the blocks again when it is taken out.

Idea a sticker can be deigned which gives a map of arrangement blocks and can be used for indexing and to tally objects,

Challenge is to design a sticker in such a way that gives map of instruction before closing and also gives list of materials inside it after closing the lid of box.

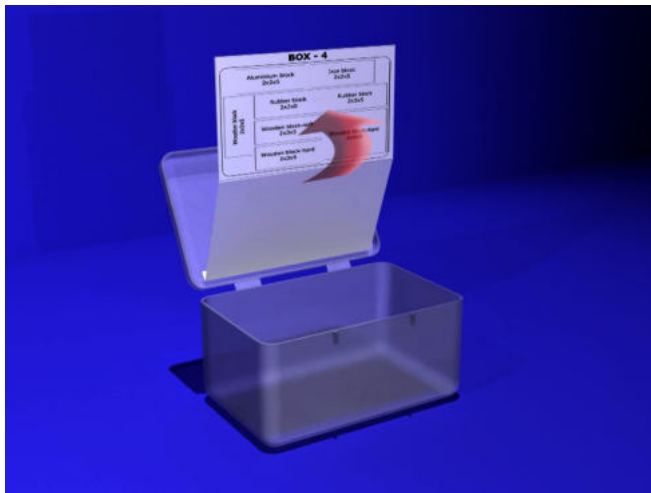
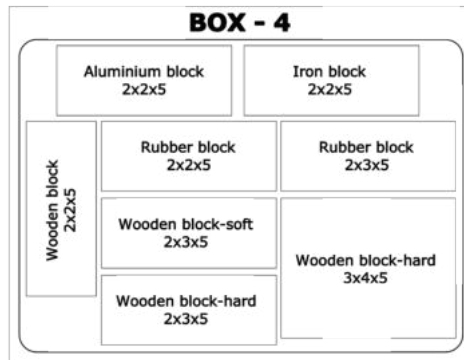
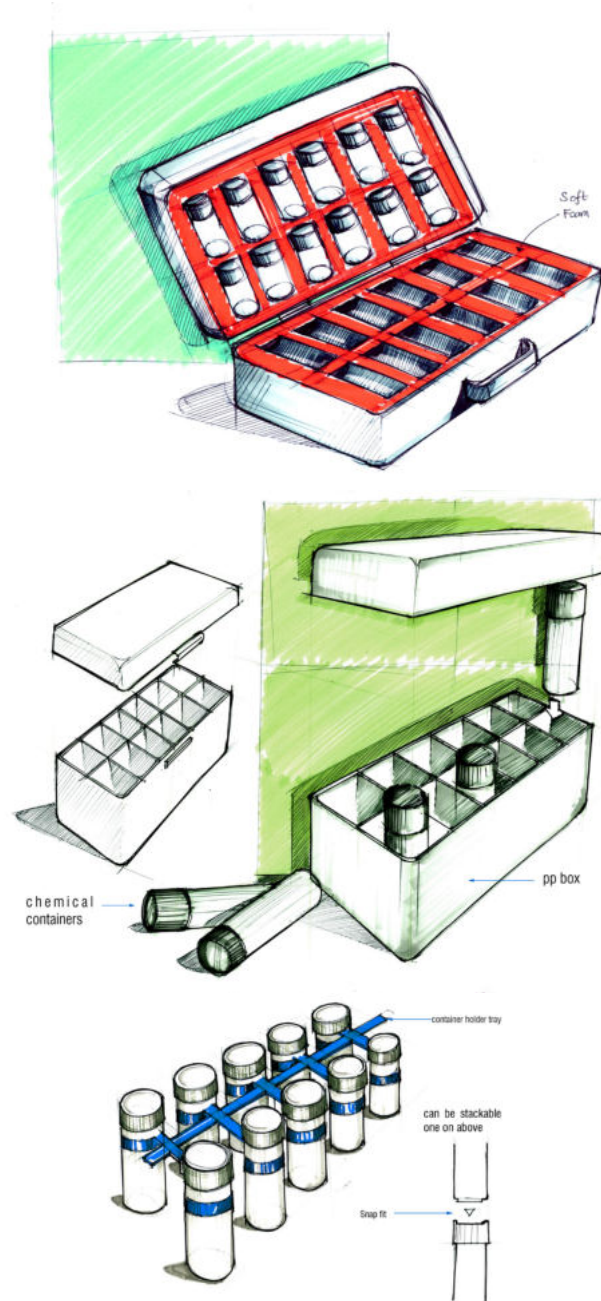


Fig.10:Existing chemical box



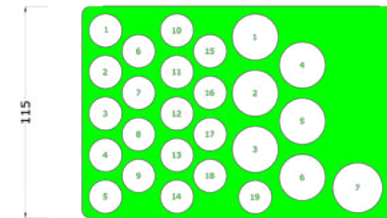
Fig.11:Ideation for chemical box



## Chemical box

- Dealing with chemical box is tough because there are two boxes and finding right chemical at initial attempt is inconcievable.
  - Since there is no proper arrangement of chemicals as per their properties, so  $H_2SO_4$  affects other chemicals.
  - Solidification of copper sulfate and other chemical because the lid of box is not closing properly
- Bottles of injection can be use to protect copper sulphate from solidification.

container name  
Right -carolina 333  
170x115x70



combination of chemical box 1 & 2

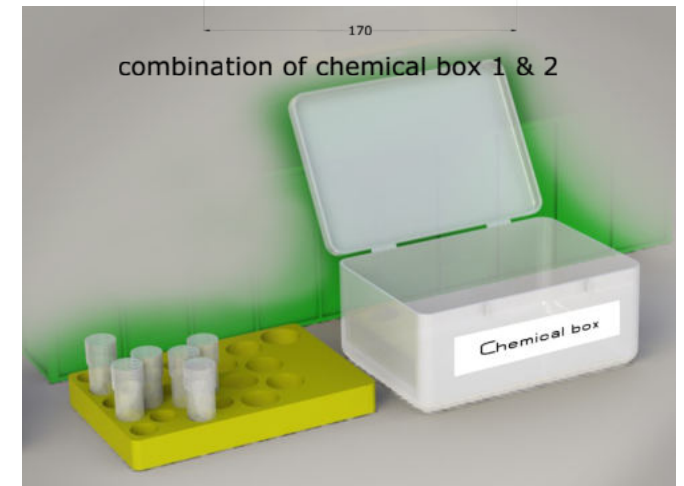


Fig.12:Ideations for arranging tools

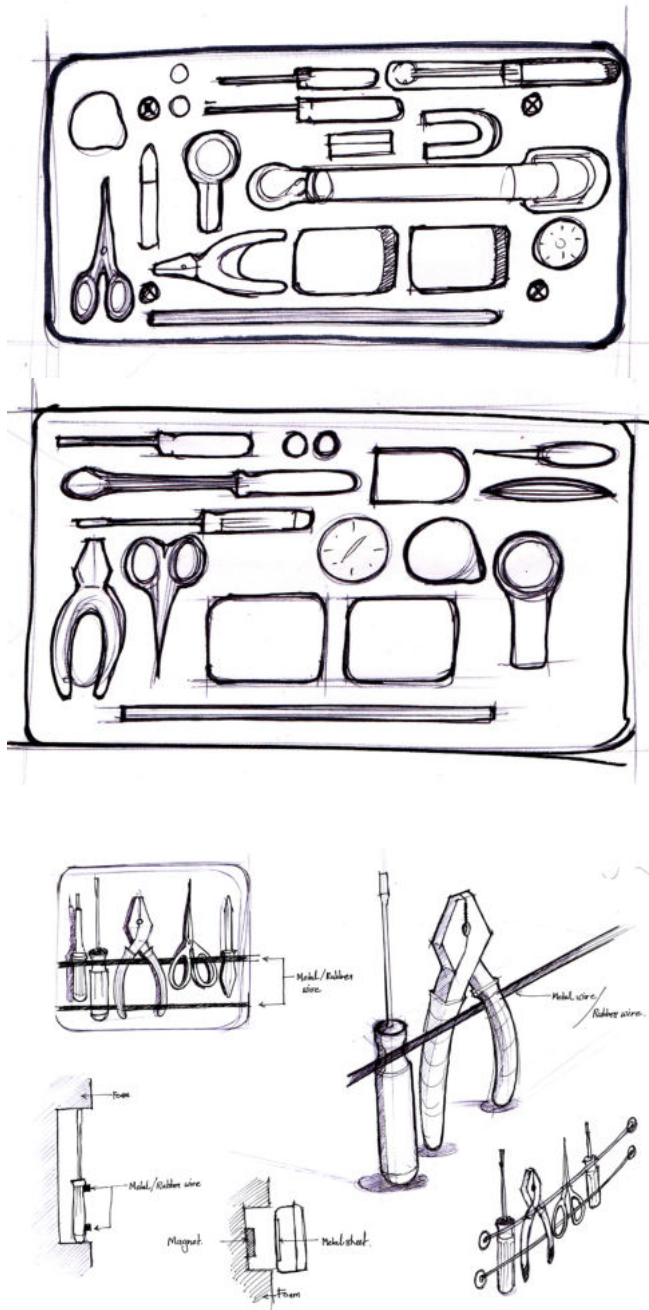
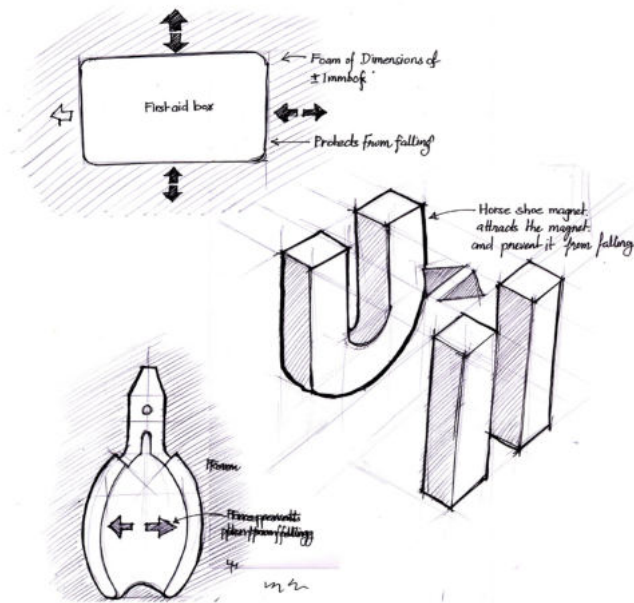


Fig.13:Concepts for tool arrangement



### Box panel design

- No grouping or logic for arranging tools
- Magnet system for sticking first aid box and microscope box increases labour cost and cost of kit also, so it should be discarded from it.
- Retaining hinge's angle is very less so it is very hard to locate tools over the top portion
- Compass should not place near magnets because magnet destroys its magnetic power.
- First aid kit and Microscope box falls while closing the cap of kit.
- A plier and first aid box falls during closing the lid and hurts other equipments, because of bad holding power.

### Exploration & Concepts

Due to limited production (500 - 1000) and the cost of production. Exploring foam with some feasible techniques will be good option.

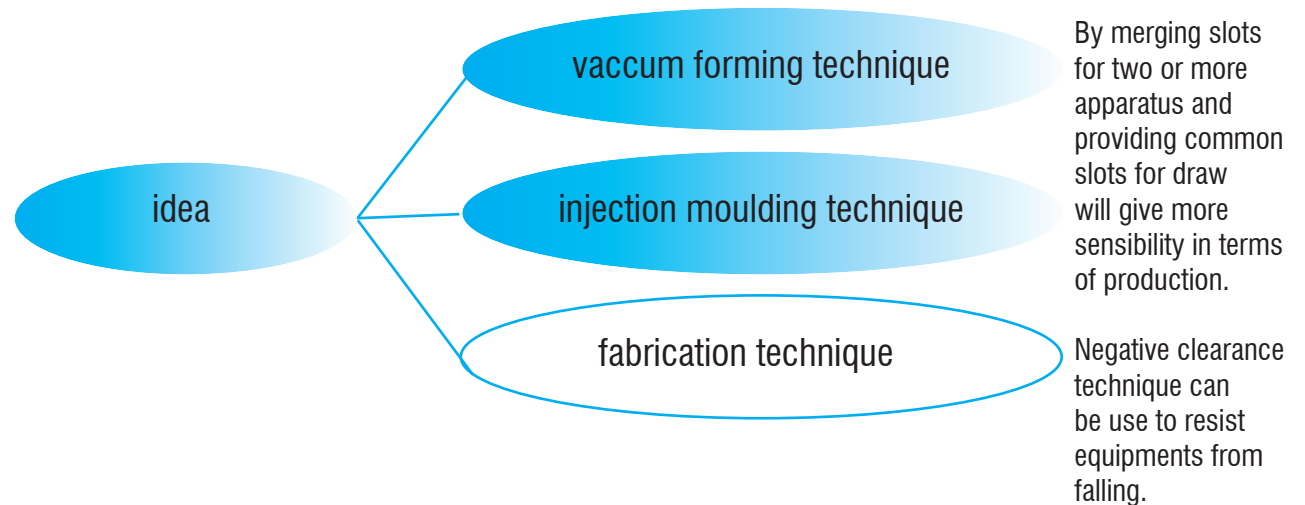
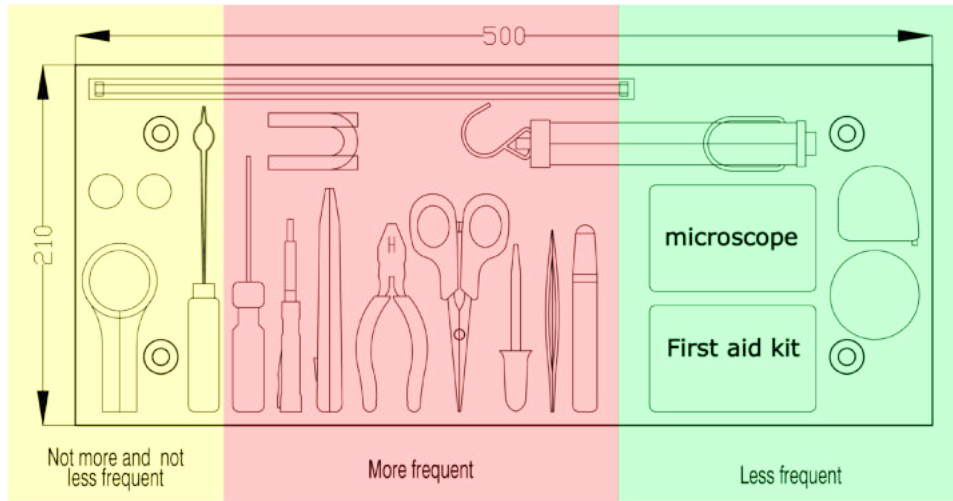


Fig.14:Drawing of cover panel

## Usability as per frequency



## Results:

- More settled way of stacking things.
- Arrangement of tools as per their usability.
- Slots for lenses in Box 5 which protects lenses, mirrors and glass slab from breaking.
- User Drawings for restacking, collecting and for remembering items.
- In new design we place new retaining hinge of angle 110 degree for better vision of tools.

Now magnets are placed apart from compass, so that it won't affect the magnetic power of needle of compass

Fig.15:Cover panel



# Blue sky ideation



Fig.16:Implemented science kit

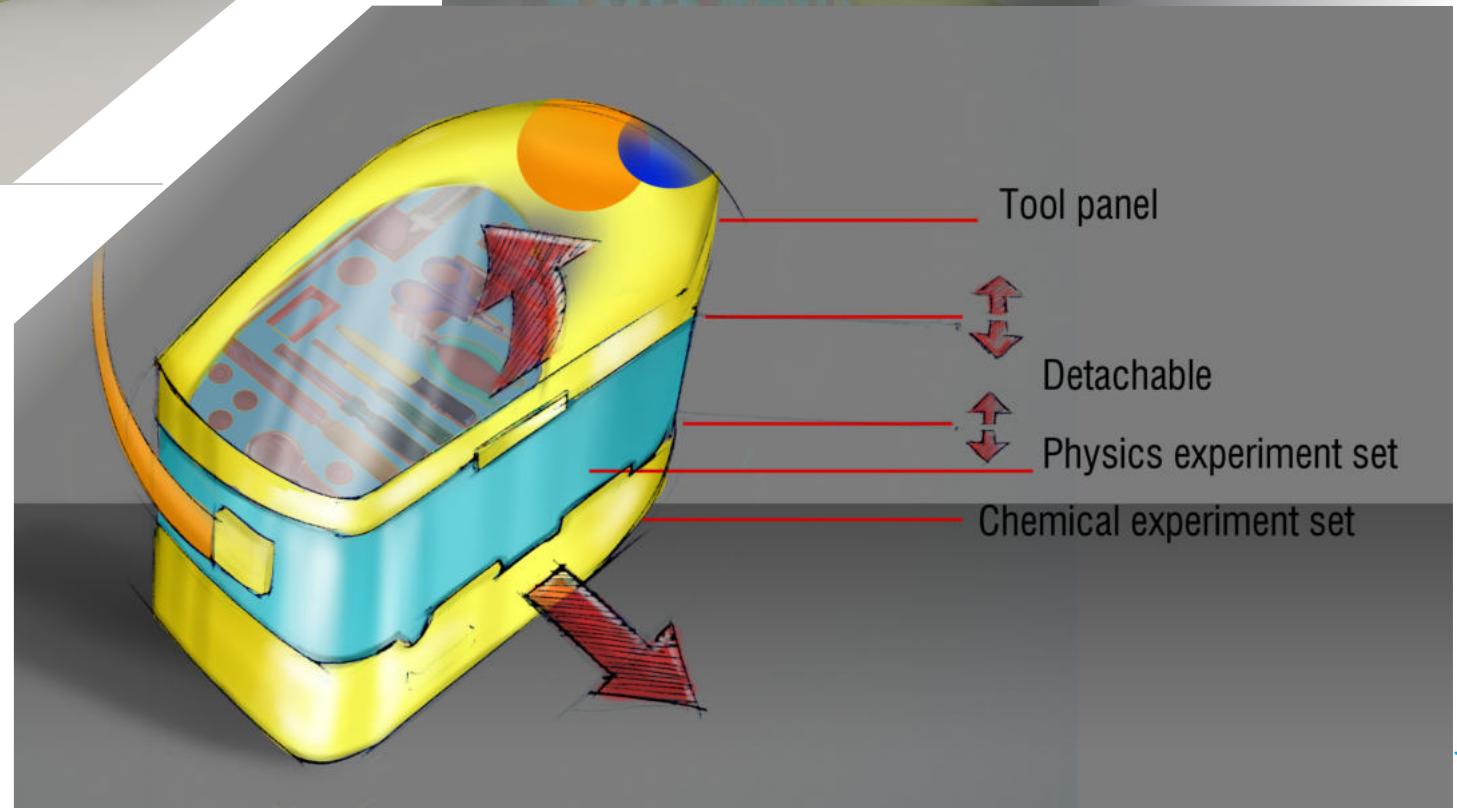
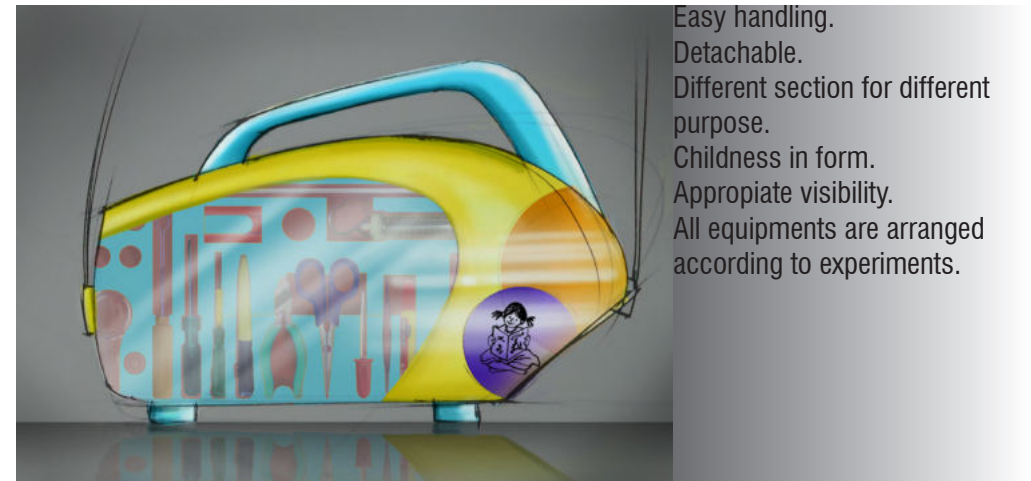


Fig.17:Blue sky idea of science kit

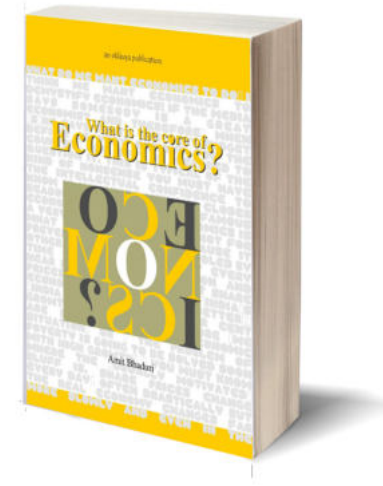
# Book illustration- "Core of economics"

**challenge** is to design illustrations for a book named "core of economics" written by "Amit Bhaduri". Amit Bhaduri has done more than most economists to explain to the general public just what it is that economists do and why economics matters. This book is best treatment for a lay reader of the key ideas in modern economics. The book is presented in five parts. This is followed by two sections on what it is that economists do, in the second part focusing on the methods we use and the third part on the practice and teaching of macroeconomics. The final part presents proposals for the reform of undergraduate economics courses in response to the crises in the economy and economics itself.

The design had to reflect his concept of economics and stand out as a unique collectable edition. This book should seduce readers away from the E-book by using a combination of contemporary illustrations and high-end production techniques to provide the reader with a highly sensory experience. (Coyle n.d.)

## Scope & limitations:

- Due to the nature of my project illustration should be in line drawing style, because book will be published in monochromic style.



- Illustration should express the whole story of that paragraph which it belongs.
- It should express the whole thing written on that page especially for lay person.
- Our output may be in a JPEG or PDF format.
- I don't have to create 3D artworks, traditional paintings, and animated/moving/Flash-based Illustrations.

The drawing should visible when taking it as smaller as possible size.

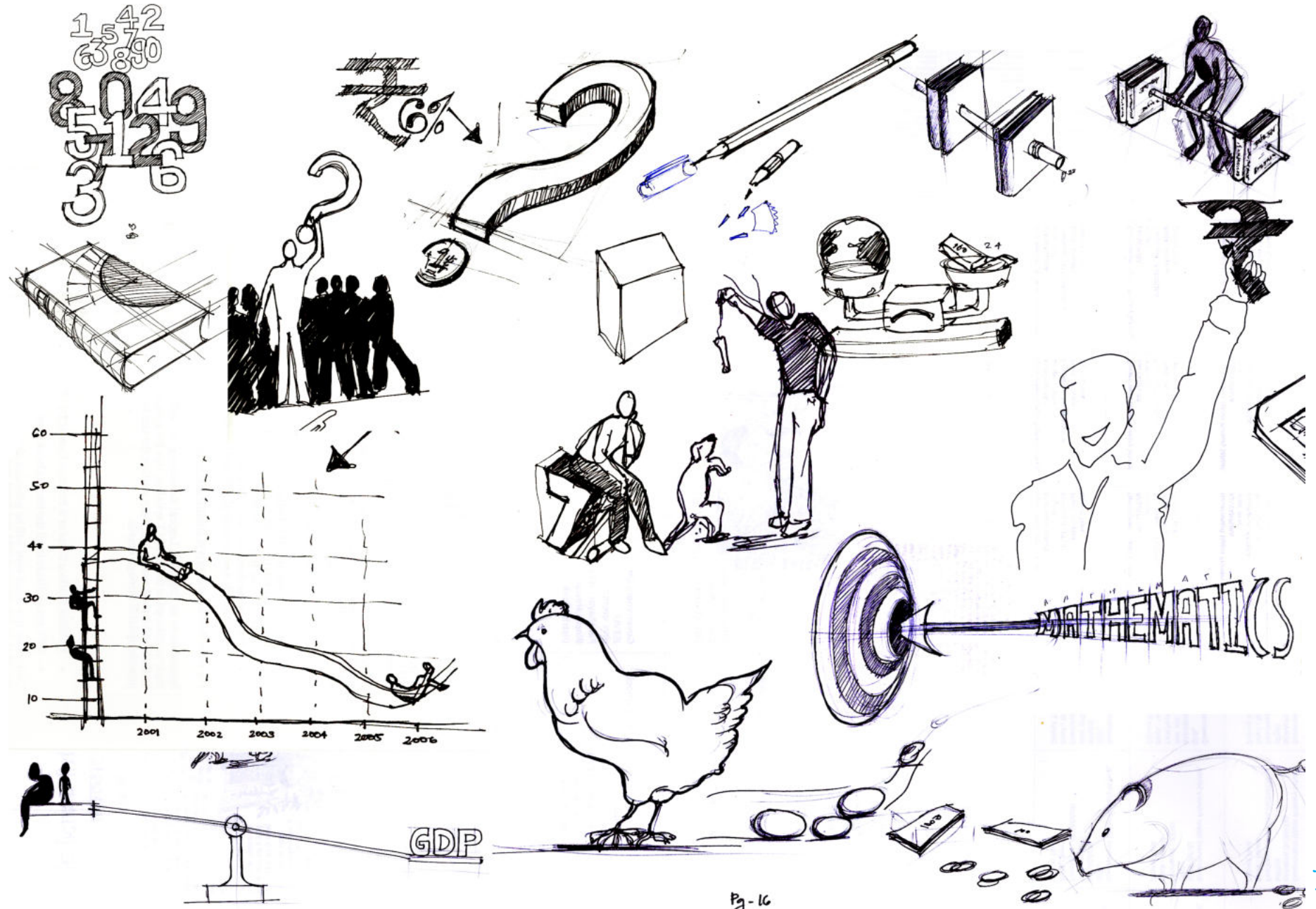
## Inputs:

- Involving more human figures.
- Illustration should convey the message to lay person also.
- Female characters are very less in illustrations.
- Try to complete the more or more paragraph in one unit.

Reader should understand what the thing is written in that body without reading it ( with the help of illustrations)



Fig.19:Exploration 2



Pg-16

Fig.20:Exploration 3



**Result:**

1

Aim of this illustration is why economics is important for ordinary citizens.

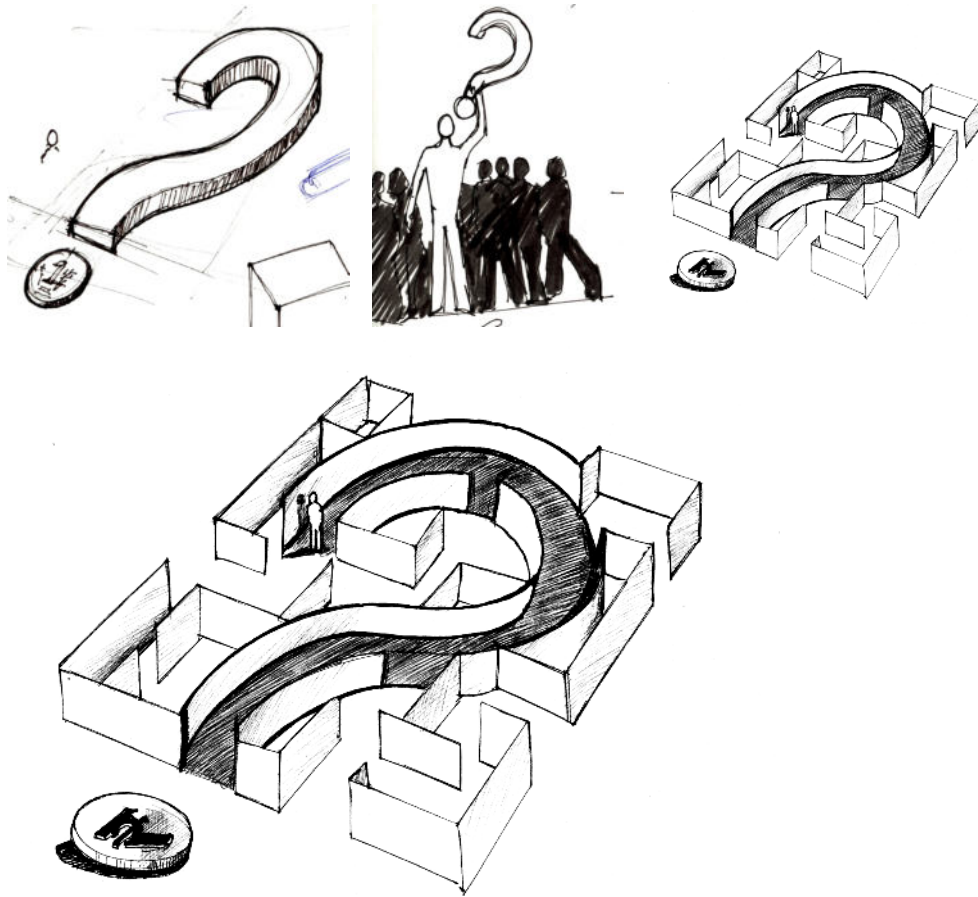


Fig.21:Illustration 1

**Keywords:** Question, people, economy.

A famous economist once said, economics is a very important subject not for what it teaches, but because it prevents you from being fooled by other economists. Almost every time you open the television and hear pundits talking about share prices going up, therefore “India’s economic health is much better;” or “India is having an 8 per cent growth rate” and therefore “we are in a wonderful economic situation” or “the problem of poverty is going to be solved soon with high growth” – you must know where the (usually motivated) bluff is.

2.

How government spent money and why its spending are not useful for ordinary citizens

**Keywords:** Money, spending, common wealth games, spectrum allocation,

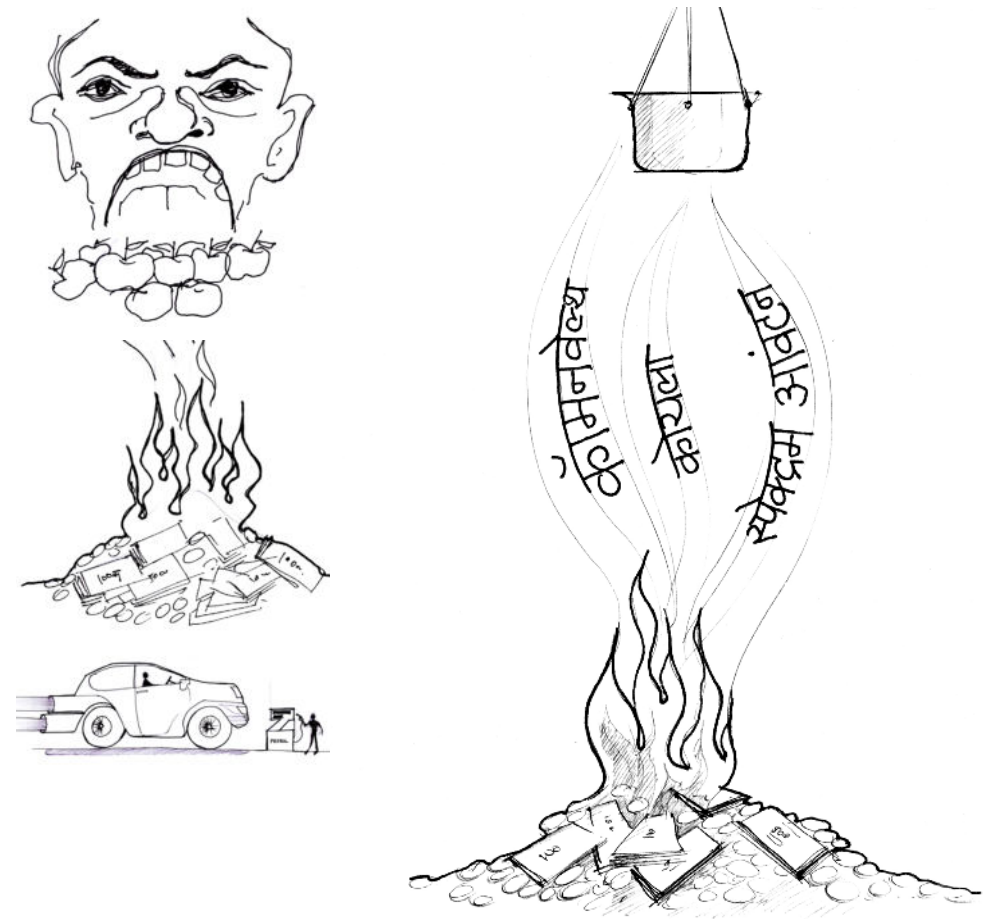


Fig.22:Illustration 2

The issue is not how much a government should spend but whether its spending is useful for ordinary citizens. We should resist wasteful spending like the Commonwealth Games, scams like Coal or Spectrum allocation that diminish the budget of the government to help large private business. But we have less reason to cut spending on health insurance and education for the poor citizens because if done successfully it would increase the credibility of the government and its ability to sustain higher debt. Instead the game has become one of reducing public finance to housekeeping in the name of ‘fiscal discipline’ which increasingly means disciplining the poor to help the rich in India.

3.

How experience, ideology, and numbers can contribute to make a good economics.

**Keywords:** Experience, ideology, numbers, interaction, human being.

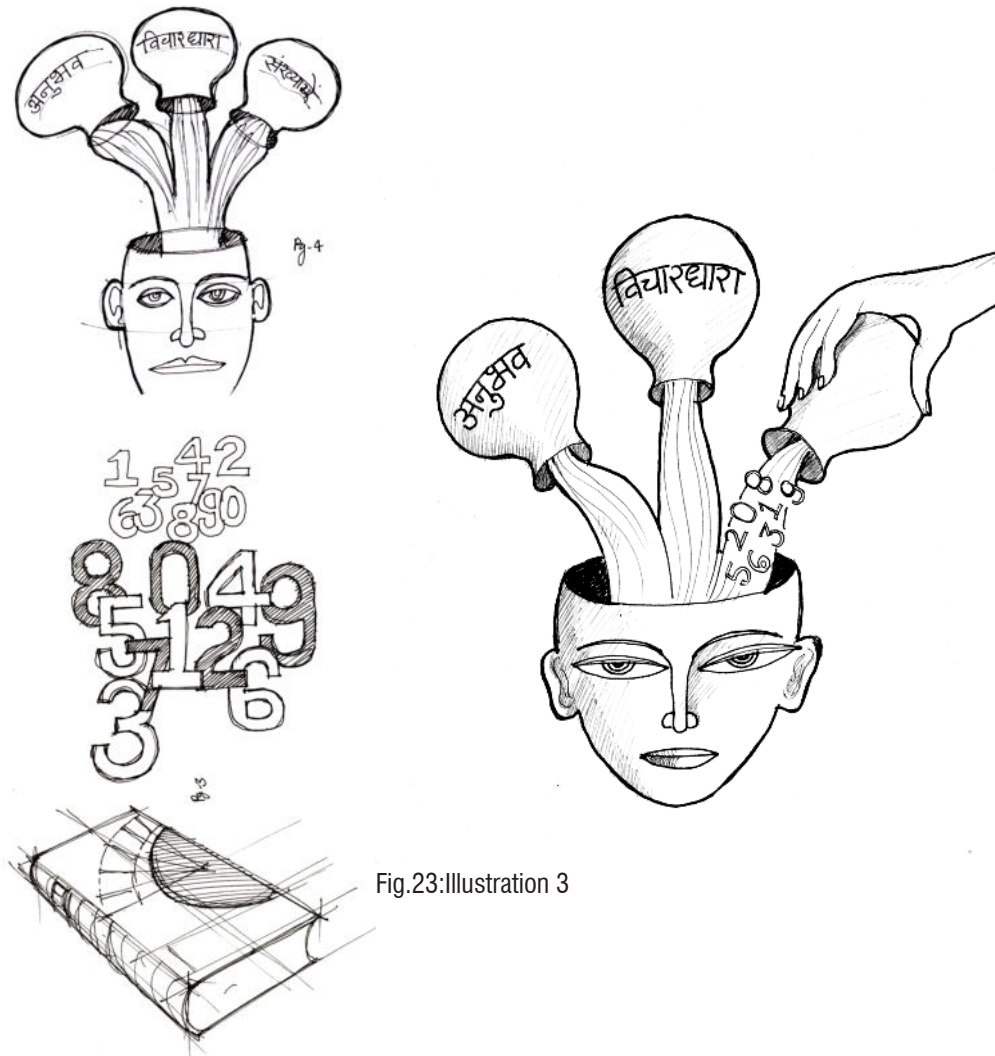


Fig.23:Illustration 3

It is through a complex interaction between experience, ideology and numbers that we have to conduct economic reasoning. That really becomes distilled commonsense. When it does not fit in with our pre-conceived commonsense (or 'knowledge by introspection') we must ask why. That is the more complex function of training in economics. Perhaps that is also the beginning of being a real economic theorist of relevance.

4.

Here author introduced a new chapter 'Microeconomics'.

**Keywords:** Economics, human being, micro, relationship.



Fig.24:Illustration 4

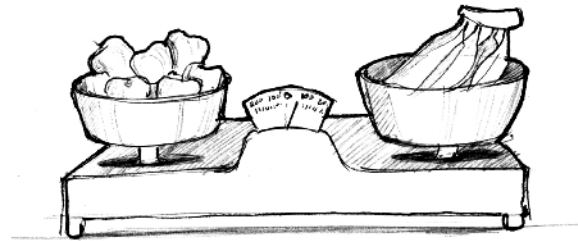
If you look at microeconomics, it has two basic elements. They can be useful; they can also be misused. There are two things one should know, let's say, in high school economics or the first year of college. The first element is some idea of how choice, individual choice, is discussed in economics. All one really needs to know is something very simple, the basic idea in the theory of choice. Choice is made not on the basis of exact knowledge but 'inexact' knowledge.

5. The difference between quantitative idea and prediction in economics.

**Keywords:** Numbers, ideas, confusion.



Fig.25:Illustration 5



So how do we represent this? One way of representing this is, say, 2, 3, and 5: where 2 are different from 3 by 1 but 3 is different from 5 by 2. You know the exact magnitude of difference because they are 'cardinal numbers'. So there is a bigger difference or distance between 3 and 5 on the number scale (measure) than between 2 and 3. Now, when you not only know that something is bigger than something else but you also know how big the difference is – quantitative idea of how big the difference is – you call it cardinal measurement. And you might say, I prefer 5 to 3, and I also know by how much I prefer it.

6. Insurance premium of a 60 yr old man is more than 40 yr old.

**Keywords:** Insurance, protection, 40 yr old person, 60 yr old person, premium.



Fig.26:Illustration 6

An insurance company takes a 40-yearold and a 60-year-old. They will ask for a higher insurance for a 60- year-old. Why? They will say that the 60-year-old is likely to be more prone to illness and death, so we will take a higher premium. This is not exact knowledge. This is one kind of inexact knowledge: it is probabilistic inexact knowledge.

7.

Price rise reduces real income and raise the prize of some items.

**Keywords:** Price rise, income, poor class, price hike.

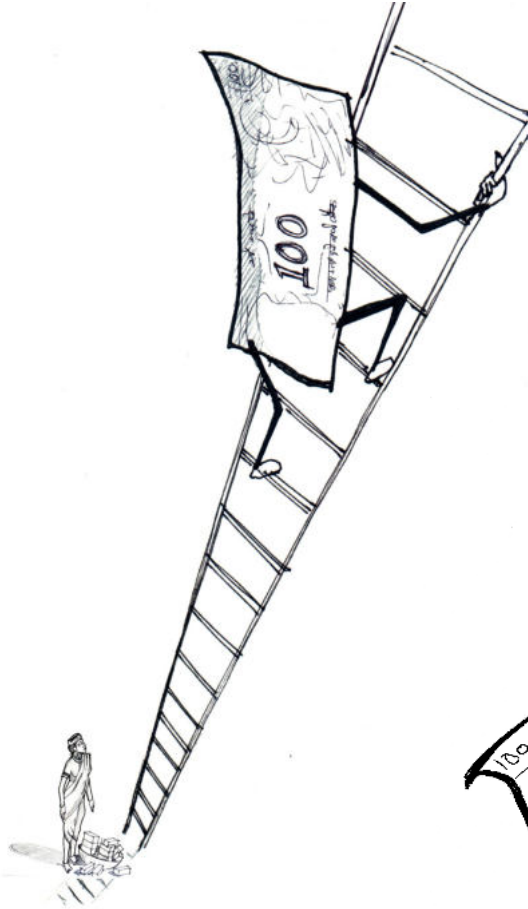
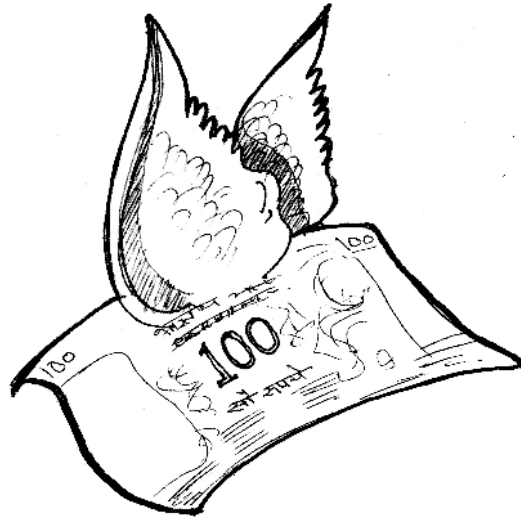


Fig.27:Illustration 7

One way to begin to analyze it is to say that whenever the price rises, particularly of an essential commodity (let us say, food prices rise), what does it do? It does two things: it reduces your real income if it is fixed (e.g. salaries, pensions, etc.) and it obviously raises the prices of some items of food more compared to others and with limited income you try to buy the cheaper



substitute. Economists think of these in a way which actually changes your basket. For example, you will buy less those vegetables whose prices have increased relatively more; at the same time, vegetables whose prices have increased less, you will substitute in their favour (substitution effect).

8.

Economics is a subject where evidently false approaches and counter-intuitive assumptions can persist.

**Keywords:** Many ways, breaking paths, mindset, and false approaches.

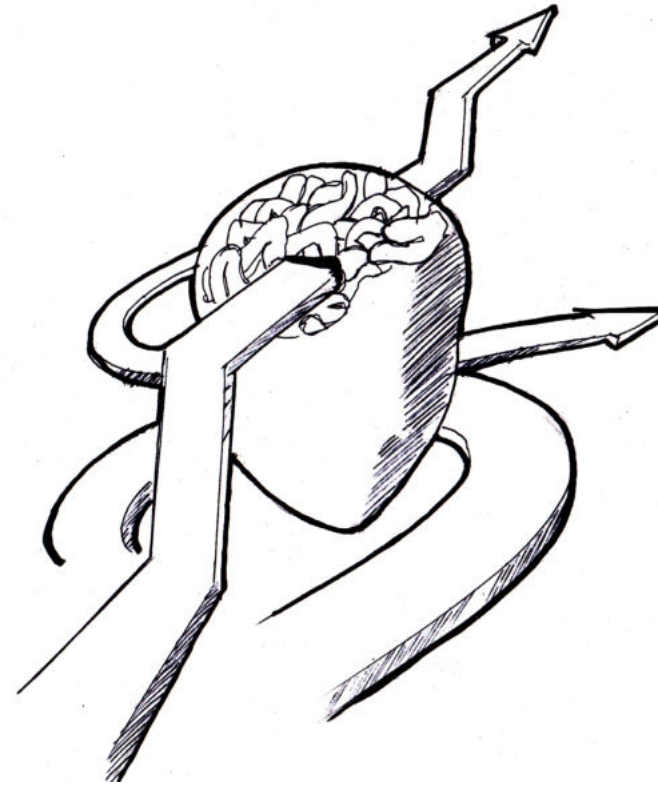
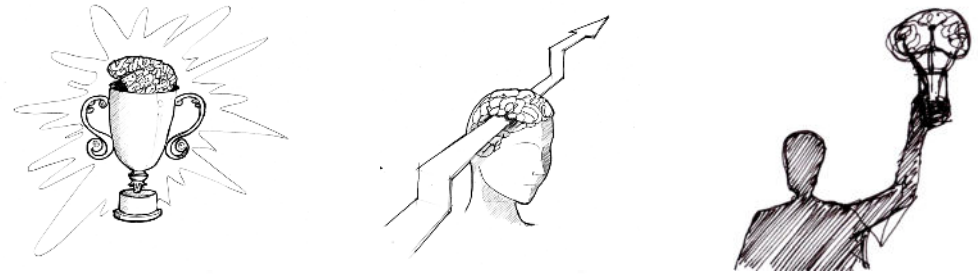


Fig.28:Illustration

Not because of their relevance, but because of their ideological implications, and their power to reproduce themselves through reward and powerful vested interests. You learn the required algebra and get your professorship in a known university, may be even Nobel Prize, and acquire intellectual respectability to propagate what the powerful interests would be pleased to hear.

9. Take another example: the wage cut controversy which actually is an application of game theory.

**Keywords:** Wage cut, income, knife, scissor, boss and employee.

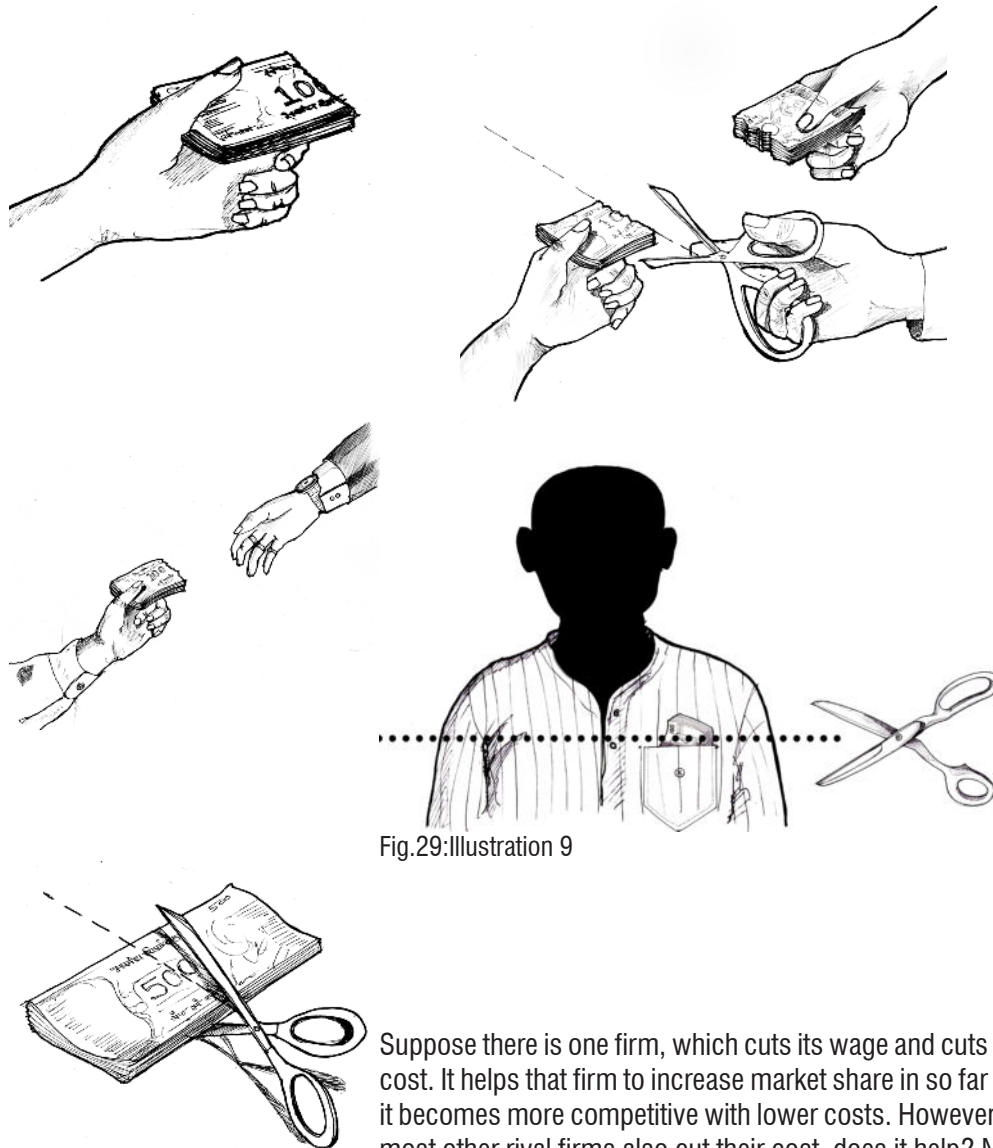


Fig.29:Illustration 9

Suppose there is one firm, which cuts its wage and cuts its cost. It helps that firm to increase market share in so far as it becomes more competitive with lower costs. However, if most other rival firms also cut their cost, does it help? No, because relative positions don't change.

10. Take another example: you decide to attract industry by giving it incentives.

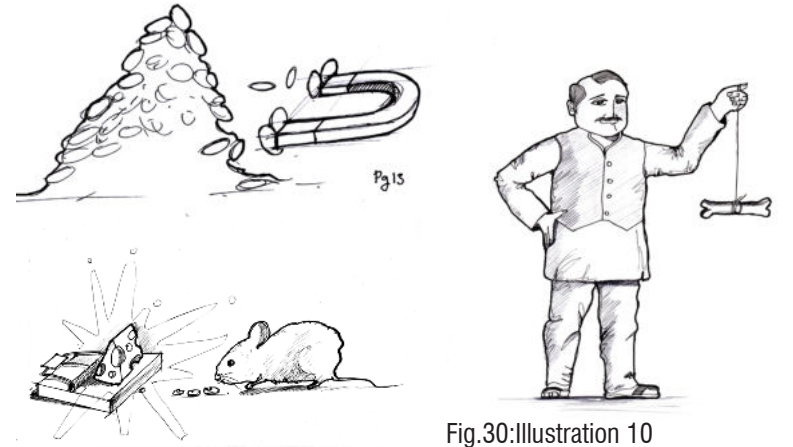
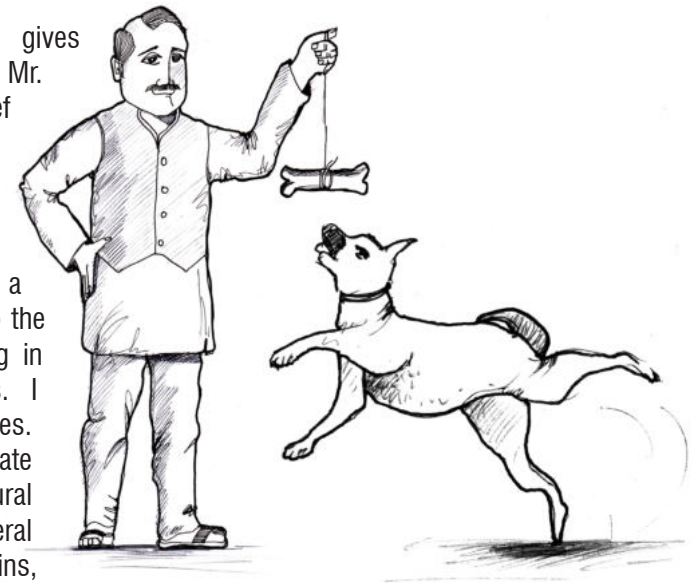


Fig.30:Illustration 10

**Keywords:** Leaders, industries, attraction, incentives.

So Mr. Modi in Gujarat gives incentives to the industries. Mr. Bhattacharya, as CPI(M) chief minister in West Bengal, did the same, as did Mr. Navin Patnaik in Orissa. What happens in the process? Everybody is involved in a competitive game of race to the bottom, and who is gaining in the process? Industrialists. I could multiply these examples. You give concessions to private industry in terms of natural resources – land, mineral resources, forests, mountains, and water and coast lines. It is a race to the bottom in which private industries gain.



11.

India has grown at twice the world average simultaneously poverty increases in India.

**Keywords:** Poverty, development, rich people, poor people.

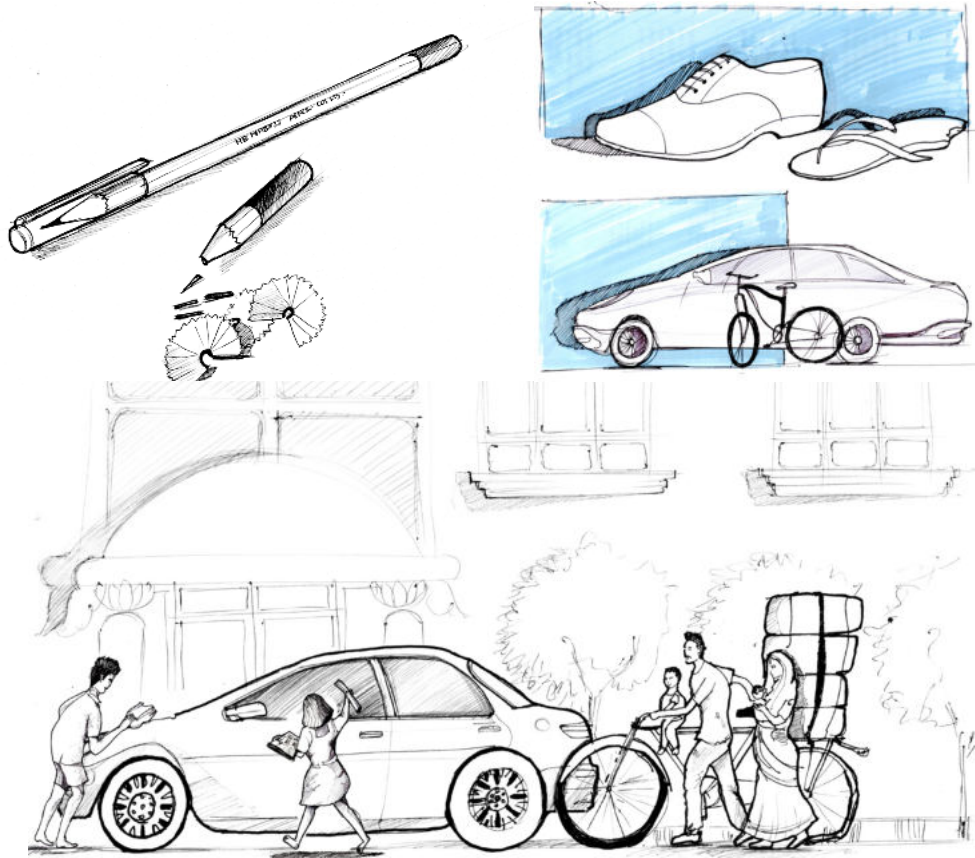


Fig.31:Illustration 13 Development vs poverty

What has happened to poverty? India's share today is close to 40 per cent of the world's poor! This means that the rest of the world including sub-Saharan Africa reduced poverty faster than India though they grew slower. One way to link output growth with the question of inequality is to try to explain this. The rest of the world have reduced poverty faster and grown slower! Students should be told to think about it. Do you ever hear it on TV? Do you ever hear our prime minister say this? Do you ever hear our finance minister worried over this? Such questions are killed by silence, deliberate or otherwise. Good teaching of Indian economics would be to raise these questions and ponder over their answers. If you say poverty has been reduced due to high growth (trickle down), you should be able to discuss it in this context.

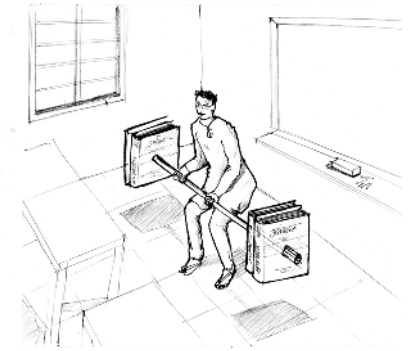
12.

The basic problem of our teaching is that so much pressure is put on students and on teachers at school level.

**Keywords:** Teaching, teachers, books, chapters, weight, pressure.



Fig.32:Illustration 14 teaching under pressure



Teachers are given so many books and are told you teach this in micro, that in macro, in statistics, in algebra. I think this does not help anybody, students or teachers. For people who stay in academics, what really makes the difference in terms of originality and sustained interest is a grip on the basic ideas and examining their relevance.

15.

Ultimate goal of learning basic economics.

**Keywords:** Knowledge, economics, ordinary people, resistance.

The extreme philosophical position of 'logical positivism' would have us believe that realism of assumptions is irrelevant and that it is the conclusions that can be tested to settle matters. However, tests are not unambiguous in a subject like economics without controlled experiments, nor is it true that a unique set of conclusions necessarily follow from a given set of assumptions. The ordering of information as hard or soft is not context free, e.g., the probability of a higher percentage of people dying of violent car accident, or in a situation of war, may be higher. These are some of the ideas more important to discuss than only the formal derivation of the 'multiplier'. Actually, Keynes was the one who put it most clearly, and a whole controversy arose over it later – between the monetarists and the Keynesians.



Fig.33:Illustration 15

# learning



## Internship in career

The internship objective is beneficial to the internee because it helps in reducing the anxiety of the internee up to some extent. Not knowing anything or going to a place which is unknown creates anxiety that can negatively affect learning. Therefore, it is important to keep the participants aware of the happenings, rather than keeping it surprise.

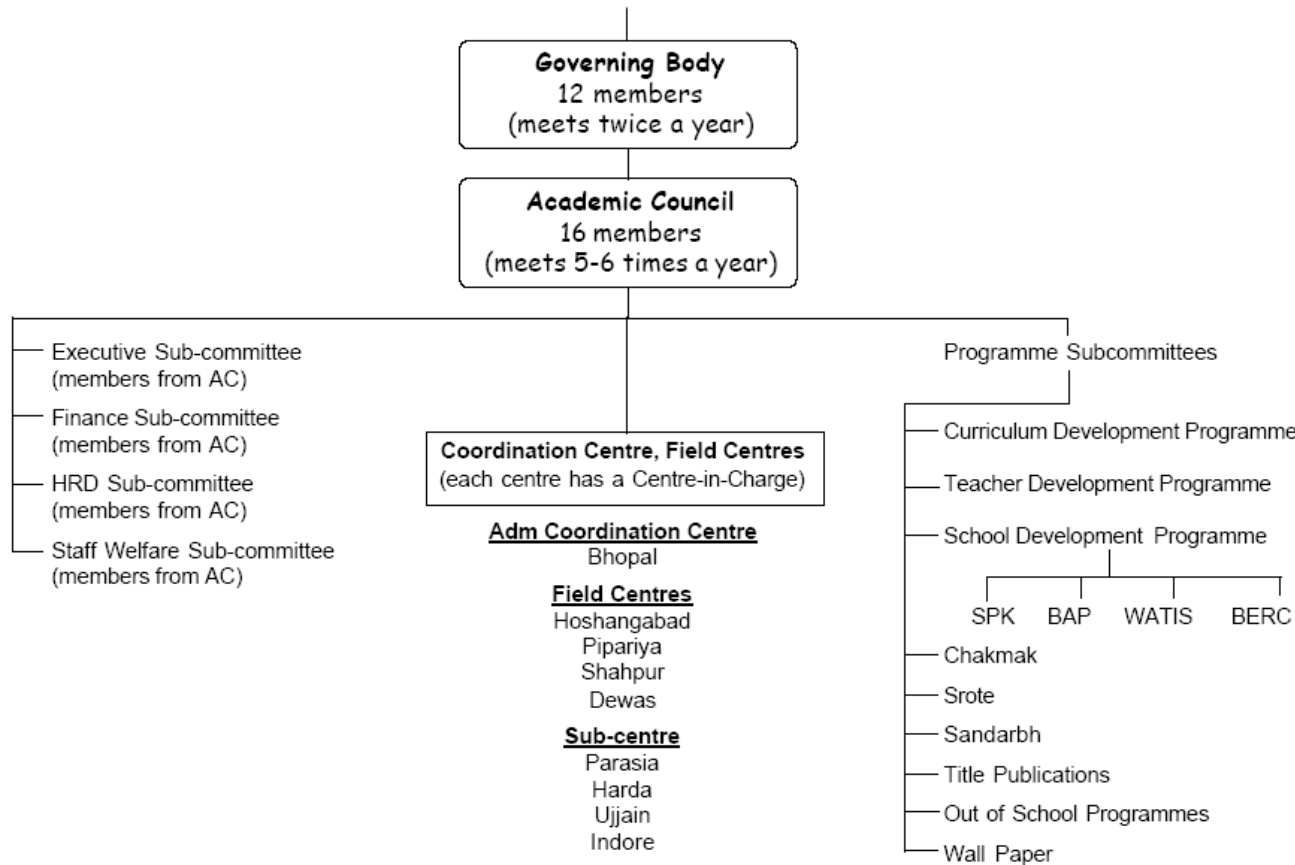
It helps in increase in concentration, which is the crucial factor to make the internship successful. The objectives create an image of the internship program in internee's mind that actually helps in gaining attention.

## Work ethic

Eklavya's publishing and dissemination efforts are guided by its school and community based programmers. The overriding concern is to keep the reading material close to the life and environment of the readers and also produce it at a price they can afford. In this context it publishes three magazines - Srote, a weekly feature service for newspapers focusing on science, technology and science-society interface issues, Sandarbh, a bi-monthly teachers' resource magazine on science and education, and Chakmak, a science magazine for children. Eklavya has published book titles in Hindi, English, Marathi, Gujarati, Bangla and Urdu. It has also published some titles in non-mainstream languages like Gondi, Koru, Malwi and Bundeli.

PITARA is a one-stop-education-store conceived by Eklavya that makes available a range of carefully selected books and educational materials of select publishers and

# E K L A V Y A



organizations from India. It also disseminates the Eklavya materials.

## Our Vision

Meaningful education for all to build an egalitarian and just society on the path of sustainable development.

## Our Philosophy

We believe that the education system needs innovations that respond to the needs of children and redefine the role of teachers

## Conclusion:

When we start our internship we will have the opportunity to work as part of a team on a wide variety of users, ranging from small owner-managed businesses to large groups of companies trading both in the India and internationally. This will involve work of both designing and developing nature, and we will gain strong skills in both of these key areas. I was additionally receiving hands-on involvement with educational design work, again building up strong skills in this area although we specialize in a number of areas. You are encouraged from an early stage to use your experience gained to provide sound 'value added' business advice to users.

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## Software used

