CONCEPT

CREATIVITY

IDEA

VISION

INNOVATION

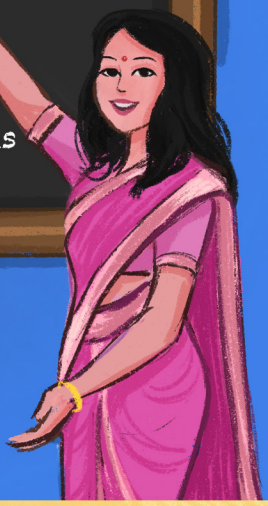
TECHNOLOGY

SOLUTION

inspire
manak

Teachers Handbook For

Nurturing students ideas/innovations



सत्यमेव जयते

विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY

राष्ट्रीय नवप्रवर्तन प्रतिष्ठान – भारत
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Teachers Handbook For

Nurturing students ideas/innovations

DIRECTOR'S MESSAGE

Dr. Arvind C Ranade
Director
National Innovation Foundation –India

Dear Teachers,

"A life of joy and happiness is possible only on the basis of knowledge and science" - Dr. Sarvepalli Radhakrishnan

The INSPIRE-MANAK (Million Minds Augmenting National Aspiration and Knowledge) program is a nationwide initiative of the Government of India to tinker with student's imagination and unleash their creativity to bring out cutting-edge scientific and innovative solutions. It is jointly executed by Department of Science and Technology (DST) and National Innovation Foundation (NIF) – India.

This program aims to motivate students in grades 6 to 12 to pursue Science and consider a career in Research. The basic objective is to attract talent, give them exposure to science at an early age, and foster a culture of creative and innovative thinking among them to address societal needs through science and technology. Under this scheme, one million such ideas have been targeted every year from more than six lakh schools in the country.

Teachers have the unique opportunity to provide the right direction to students in various aspects, including their internal creativity, career, behaviour and character, because of their direct interaction with these young and impressionable hearts and minds. Therefore, with your cooperation, we wish to unleash one million creative ideas from students across our country by introducing you to the world of INSPIRE-MANAK through this handbook. This handbook will help you discover how to spark curiosity and critical observation in the students and guide them in transforming their ideas into actionable solutions. It will also be useful to unlock student's true potential through proven brainstorming techniques and empower them to tackle real-world problems with confidence.

This is not just a handbook rather it is an innovation toolkit. This will assist you in going beyond textbooks and equip your students with the skills and confidence to shape the future of our nation with their brilliant innovations. I urge you to unleash their creativity, ignite their passion for problem-solving, and witness their potential blossom with a sense of satisfaction and pride.

Get up! Join the INSPIRE-MANAK movement today and empower young minds to shape the future!

With best wishes,

Arvind C Ranade

CONTENTS

CHAPTER I INTRODUCTION

> "Man needs his difficulties because they are necessary to enjoy success".
>
> Dr APJ Abdul Kalam

The purpose of this handbook is to help teachers involved in the INSPIRE-MANAK activities understand concepts related to innovation and thereafter facilitate the ideation process among students by sensitising their inquisitiveness and imagination. This handbook has been developed in line with the objectives of the INSPIRE-MANAK scheme and has detailed information related to innovations, some examples and explanation of the concepts of prior art search, proof of concept, prototyping, value addition and product development.

The INSPIRE-MANAK is not just a competition; it is a mission to make our children creative problem solvers. Promoting problem solving ability, originality, creativity and innovative spirit of our children will help them in becoming leaders who will design and build an inclusive future for our country.

1. India's First Innovation Challenge

Innovation is not something new that comes to India, it has been a pioneer in innovation since ages. But do you know that the first competition for innovation was announced by the Father of our nation, Mahatma Gandhi, and that too way back in 1929! Mahatma Gandhi was not only a social or political innovator

with successful experiments of *Dandi March*, *Satyagraha*, *Swadeshi* and Non-cooperation, he understood the role of science and technology in the development of nation equally well.

In order to increase the dependence of Indians on their products specifically clothes, the British used to export crude cotton from India and import into India the western clothes, which were sold at a high cost to the people. With this, they were also systematically subduing many other local sectors. Gandhiji realized that if *Khadi (hand woven natural fibre cloth)* had to become a symbol of resistance and if people were to use *swadeshi khadi*, the capacity of the *charkha* (spinning wheel) had to be improved. At the behest of Gandhiji, in July 1929, *Akhil Bhartiya Charkha Sangh Workers' Samiti* announced a world-wide

innovation challenge for designers and innovators, to develop a *Charkha* or a *Samyukta Yantra* based on certain defined guidelines as below. The award money then offered to the winner was Rs. one lakh.

- Charkha must be light-weighted, easy to move, and it should be in such a way so as to be operated using either hand or one's leg in a natural way in the rural cottages of India.
- It must be in such a way that a lady shall be able to work with it for eight hours at a stretch without great effort put in.
- Either Charkhas must have a build to accommodate the use of a puni (used to make handspun cloth) or along with the charkha there must be a way to handspun cloth.
- On working with the charkha for eight hours at a continuous stretch - it should result in 12 to 20 numbers of 16000 feet yarn.
- The machine should be designed such that it costs no more than Rs.150 in producing it in India only.
- The machine should be robust and well-made and with time-to-time servicing it should be capable of running for at least 20 years without any stopping. Servicing of the machine should not cost much and every year not more than 5% of the cost of the machine that year shall be needed for servicing.
- All those taking part in this contest may, with their own input costs and expenses, send their machines to Sabarmati Ashram before or not later than 30th October, 1930. In case the machines satisfy the criterion mentioned - then the inventor/designer can patent it on his name to protect their rights on them. But, if they wish to become eligible to win the prize money of the contest, then the designer shall have to transfer the rights of the patent to Indian Charkha Sangh Council.

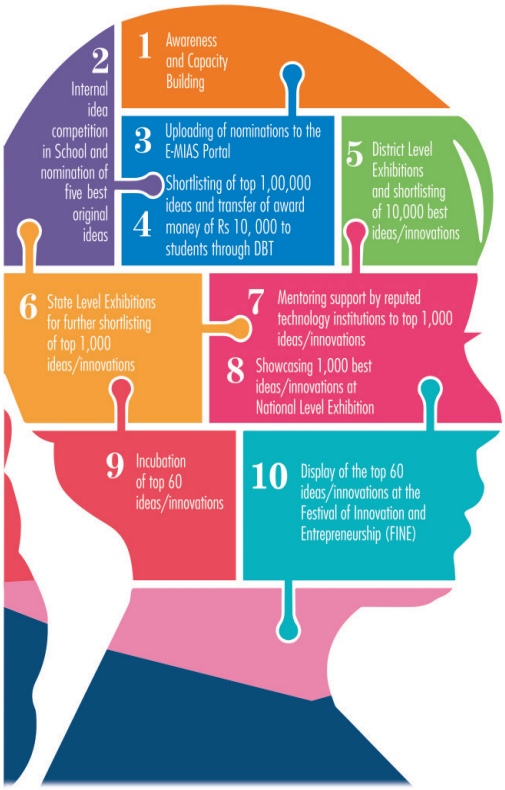
2. What was the Outcome?

It was progressive on the grounds that, by empowering Indians to make their own fabric, it freed them from using the British products. The creative charkha turned into an empowering innovation and has been a tale of great social change known to the world.

3. INSPIRE-MANAK

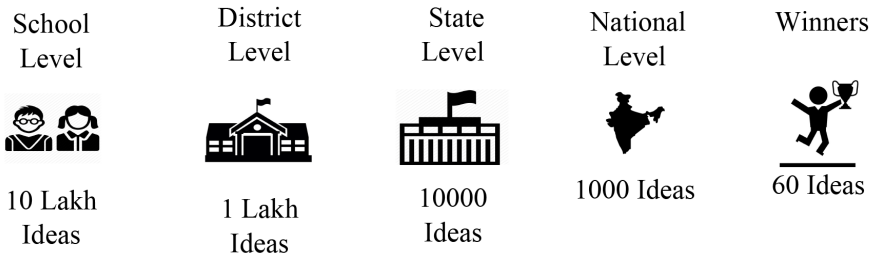
'Innovation in Science Pursuit for Inspired Research' (INSPIRE) scheme is one of the flagship programmes of Department of Science & Technology (DST), Ministry of Science & Technology, Government of India. The first component of the INSPIRE Scheme – the INSPIRE MANAK (Million Minds Augmenting National Aspirations and Knowledge) is an initiative to foster a culture of creativity amongst school students to address the societal need through Science and Technology. It is jointly executed by DST and National Innovation Foundation – India (NIF), an autonomous institute of the DST.

The basic objective of INSPIRE-MANAK is to attract talent at early age studying in class 6 to 12) and have them exposed to excitement of creative pursuit of science and technology.



DST and NIF invite students from all government and private schools throughout the country to participate in the competition through their schools by submitting their novel technological ideas/innovations.

Under this scheme school may nominate maximum five ideas/ innovations of the students in any Indian language through INSPIRE-MANAK web portal (www.inspireawards-dst.gov.in.) The students submitting the best 1 lakh ideas/innovation will receive Rs. 10,000/- in their account through Direct Benefit Transfer (DBT) and get a chance to participate in District Level Competition. Students selected at District level will participate at the State Level Competition, of which 1000 students will be selected for National Level



Exhibition and Project Competition (NLEPC). At this stage NIF will provide mentoring support for the development of the prototype, in coordination with technical institutions of the country.

The top 60 ideas/innovations selected, will be eligible for incubation at NIF for product/process development, patent filing, linking with other schemes of NIF/ DST and display at the Annual Festival of Innovation & Entrepreneurship (FINE).

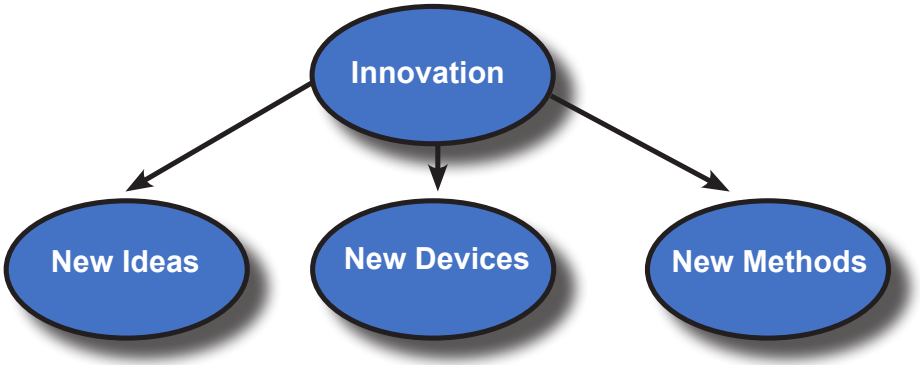
CHAPTER II

INNOVATION

"An innovator is one who does not know it cannot be done."
Dr R A Mashelkar

1. What is an Innovation ?

Innovation can simply be described as a new idea, device or method which is useful and scalable to appropriate levels. Innovation is completely measurable and is concerned with the work required to make an idea viable. By identifying an unrecognized and unmet need, an individual can innovate by using the available resources.



The best example of innovation, which everyone is aware of, is the ubiquitous mobile phone. Mobile phones were a natural transition from fixed landline telephones invented in 1876 by Alexander Graham Bell and took about a century to evolve. Incidentally, India recently celebrated the 29th anniversary of the first mobile call made in the country on July 31, 1995. Technological advancements saw the mobile phone changing its form from a hefty hand-held device to a sleek device which can fit in one's palm. Incremental technological innovations like bluetooth, Wi-Fi, camera, storage space, memory, processors, etc kept on getting added over the years with a result that today a mobile smart phone is equivalent to a computer in terms of configuration.

WATCH

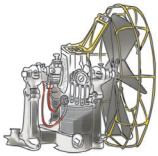
Peter Henlein is typically credited with inventing the very first watch in 15th century. There is not actually any proof that he created the very first one. With the earliest wristwatches, wearers had to wind them constantly in order to keep power in the mainspring. Components have changed, and watchmakers have found simpler ways of accomplishing the same goal.

15th century

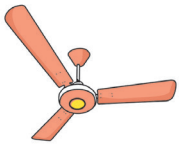
21st century

FAN

Philip Diehl had engineered the electric motor used in the first electrically powered singer sewing machines, and in 1882 he adapted that motor for use in a ceiling-mounted fan. By the time many changes have been made in terms of design and mechanism. Modern fan blades are pitched, or angled, to not only push air, but to create a downdraft so as to move air efficiently through the space.



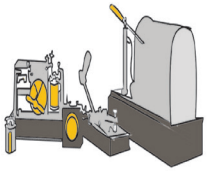
18th century



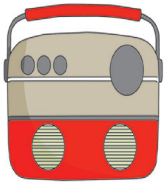
21st century

RADIO

The first edition of radio was patented in 1896. This form of radiotelegraphy allowed for simple communication between two points. This simple invention and continuous improvements led to the public radio broadcasting as we know it today.



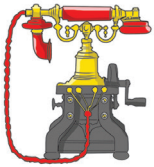
18th century



21tst century

TELEPHONE

Alexander Graham Bell's original telephone, patented in 1876, worked by converting sound into an electrical signal via a 'liquid transmitter'. The price for a long distance call was $9 for the first five minutes. Whereas today we are using the best technology at the cheapest cost.



18th century

21tst century

PRESSURE COOKER

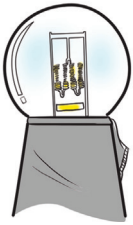
Pressure Cooker was first invented in 17th century. The cooker heated water to produce very hot steam which forced the temperature inside the pot as high as 266° F (130° C), higher than today's kitchen pressure cookers.

17th century

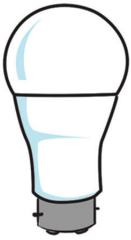
21st century

LIGHT BULB

Thomas Edison patented first light bulb in 1879. These early bulbs had extremely short lifespans, were too expensive to produce or used too much energy. Scientist continued to make improvements and that have led to the light bulbs we use in our homes today.



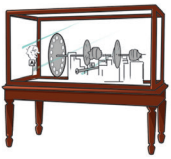
18th century



21tst century

TV

Television technology was first invented in 19th century. To transmit images, you had to place a camera in a totally dark room, then place a very bright light behind the disk. That disk would be turned by a motor in order to make one revolution for every frame of the TV picture. Today the TV we are using are the result of constant innovation.

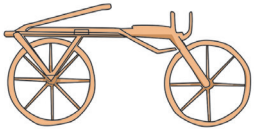


19th century

21st century

BICYCLE

The bicycle as we know it evolved in the 19th century. Bicycles were invented because a volcano killed all the horses. The first bicycles were made from wood, with steel "tires". The frame shapes were also rather wild and typically curved. Constant improvement occurs and finally we are using modern safety bicycle.



19th century

21st century

2. What is NOT to be Nominated for INSPIRE-MANAK?

It is to be mentioned here that the INSPIRE-MANAK is a competition for science and technology based innovations. It is **NOT** a science project competition where student is simply illustrating a scientific phenomena or a law through a model. But a majority of the nominations being received under the INSPIRE are repetitive in nature, not original or simply demonstrate scientific experiments/projects. By going through the examples below, it may be possible to understand and appreciate the difference between the two.

Sr. No.	Title	Description	Whether in use?	Whether unique ?	Whether Innovative?	Category
1	Wind turbine	A wind turbine captures the wind, which then produces a renewable energy source. The wind makes the rotor spin; as the rotor spins, the movement of the blades drives a generator that creates energy. The motion of the blades produces kinetic energy. Kinetic energy can be used to produce electricity.	Yes	No	No	Science project/ experiment
2	Automatic street light	An automatic streetlight turns the light on and off at a given time when ambient light falls below a specific intensity. This uses transistor as a switch and Light Detecting Resistor (LDR) as an ambient light sensor.	Yes	No	No	Science project/ experiment
3	Earthquake alarm/ detector	It is an instrument used to detect and measure motions of ground due to seismic waves coming from earthquake or volcanic eruptions nearby.	Yes	No	No	Science project/ experiment

Sr. No.	Title	Description	Whether in use?	Whether unique ?	Whether Innovative?	Category
4	Vegetable battery	Vegetables do not have electricity per se, but they have electrolytes that can transport a current when sandwiched between two different metals. The classic version of this experiment involves a lemon, a galvanized nail and a copper coin connected to a small light bulb or a LED, but you can experiment with different vegetables and different metals and record the results. If you want to make your results more precise (and more "scientific-looking") you can use an inexpensive multi-meter to measure the precise voltage produced.	Yes	No	No	Science project/ experiment

One important aspect of the INSPIRE-MANAK competition is incubation of innovative projects. By incubation it is meant that such projects will be further worked upon and improved, patents may be filed in the name of the student and technology licensing will be attempted so that the real value of the innovation could be harnessed for the benefit of the society. Hence innovative projects only are to be nominated.

Some other examples of projects, which are nominated frequently, are given below. It is to be noted that if nominated again, same or similar projects will not go further in the competition. The list below is not exhaustive but indicates those projects, which are repetitive and may not be given any consideration/ weightage further.

- Projects available in Science Books, Do-It-Yourself books/ Kits, or those described on the internet or on YouTube.
- Projects related to energy generation through turbines/ waste batteries/ dung/ vehicles/ sea wave etc. or conversion of wind energy, solar energy to electricity.
- Projects demonstrating rain water harvesting, soil erosion, water level indicator or overhead tank alarms.
- Projects related to burglar alarms, gas alarms, fire alarms etc.
- Projects related to vermi compost/ vermi wash, known methods of water filtration, self-watering system for plants, etc.
- Projects related to hydraulic lift, vacuum cleaners, etc
- Projects related to common/ available RFID and sensor based readymade projects.
- Projects demonstrating carbon/ water cycle, food chain, eco system, photosynthesis, zoo model, kitchen garden, human body parts, solar system, planet, earth movement, volcanic eruptions etc.

In addition to these no simple write ups and essays (like on reducing population or corruption) will not be considered.

3. What is to be Nominated for INSPIRE-MANAK?

INSPIRE-MANAK is looking for innovative projects that could be used in a real life situation. The following examples should illustrate this point clearly.

Examples from INSPIRE-MANAK

a) "Plastic (safety) Cap Opener of LPG Cylinder" by Sayen Akhtar Shaik from South Andaman, Andaman and Nicobar Islands

Problem: Difficulty to open the plastic cap, by pulling the nylon thread.

Solution: Developed a "Plastic (safety) cap opener of LPG Cylinder" to reduce the difficulties faced by women while opening the plastic safety cap attached with the nozzle of LPG cylinder.

b) "Paddy Filling Machine" by Marripelli Abhishek from Rajanna, Telangana

Problem: Filling of grains into bags (jute or woven plastic bags) is very hectic and time consuming job.

Solution: Developed a device, which helps farmers in filling grains in an easy and rapid way. With the help of "Paddy Filling Machine", one worker can do the work of four workers within 3-4 minutes.

c) "Fully Automatic Toilet Cleaning Machine" by Sulochana Kakodiya from Chhindwara, Madhya Pradesh

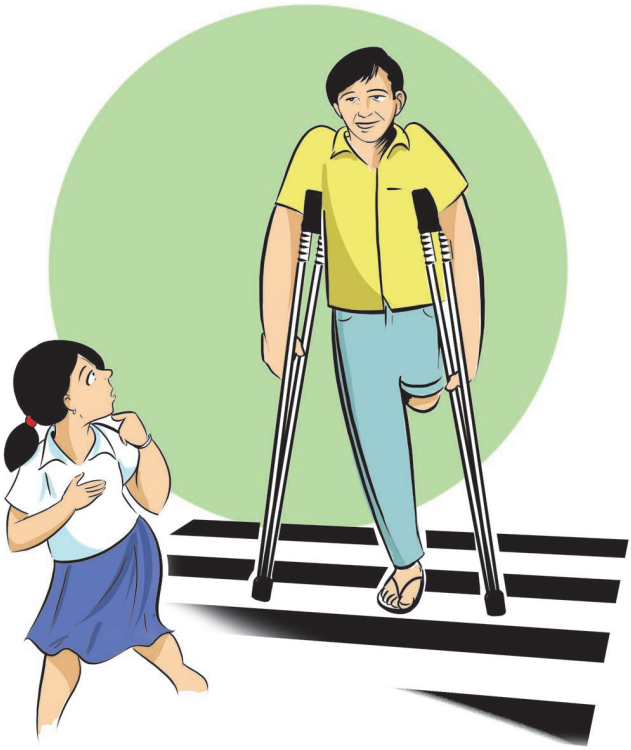
Problem: In student's village majority of people clean their toilets using bare hands. This conventional way of cleaning toilets are unhygienic and may lead to many health related issues.

Solution: Sulochana gave a solution to this problem by developing an automatic toilet cleaning machine. In this device, three types of brushes are fixed on PVC pipe. The long brush is used for cleaning the toilet seat, round head brush is used for cleaning the floor of bathroom and roller brush is used for cleaning the walls of bathroom. For every use of toilet, brushes will rotate automatically and cleans the toilet.

d) "Shock Absorbing Crutches" by Archana Konwar from Dhemaji, Assam

Problem: On her way to school one day, Archana saw a handicapped man on crutches, walking with great difficulty. Most people would have walked on, undisturbed. But the sight touched Archana and she stopped to watch. She figured out that constant use of crutches led to pain in the underarms, making it difficult to walk.

Solution: Could it be possible to reduce this pain,' she wondered. During brainstorming, she hit upon the idea of improving crutches by adding shock absorbers to reduce pain during usage, a bell to alert others to give way and a light for better visibility during the night.



NIF first came to know about Archana during a Shodhyatra, a journey by foot that seeks knowledge, innovation and creativity at the grassroots. She shared her sketch with NIF which got prototypes made based on her idea.

e) "Foot-Operated Door Opening Mechanism" by Tanmay Takale from Pune, Maharashtra

Problem: Tanmay and his friends had gone for a movie and while using the washroom, he saw that there were many people who left the washroom without washing their hands. So, even if he wash his hand, he would still be opening the door which has been touched by somebody who has not washed his hands.

Solution: This made him think of a hand-free door opening mechanism, where the door handle can be built in a way that the user can open the door with his foot and thus, avoid germs. While this mechanism is most useful in public toilets, it can also be used elsewhere and may be useful for the physically disabled or someone carrying load in both hands.

f) "Portable Latch for Restrooms" by P.S.Senthur Balaji from Erode, Tamil Nadu

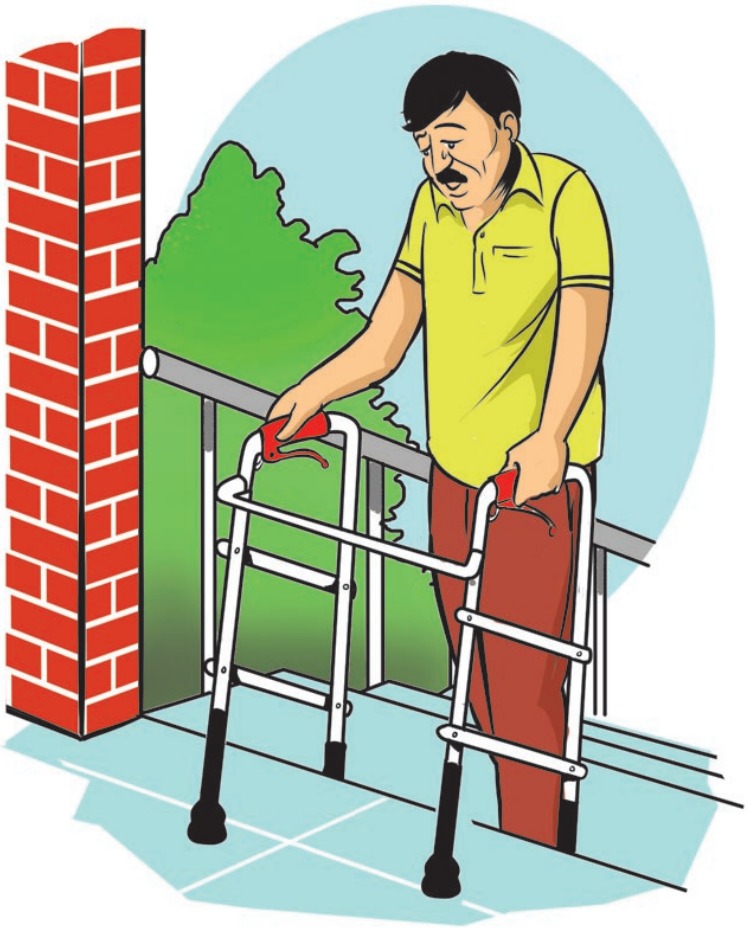
Problem: Once when Senthur had to travel to a far off place by train, the train he had to board was an hour late. While waiting, he suddenly heard his stomach rumble and realized it was upset. He rushed to the toilet at the railway station and was surprised to see that there was no latch on the door. He somehow

relieved himself but the whole experience was embarrassing. When he came out, he wondered about the plight of women travellers.

Solution: This made him to think of a portable latch, which can be useful for people travelling frequently or living in rural areas. The latch can be used for locking a door temporarily in public restrooms or other places, which have broken or no latches on the doors.

g) "Modified Walker with Adjustable Legs" by Shalini Kumari from Patna, Bihar

Problem: Difficulty to walk up or down stairs using conventional four leg walkers.



Solution: Mechanically alter the height of the legs of the walker so that they can be adjusted as per the height of the stairs.

h) "Spill Proof Kangri" by Asim Sikandar Mir from Anantnag, Jammu & Kashmir

Problem: Accidents of burns due to cinder present in Kangri.

Solution: Improvised Kangri which will remain in an upright position even if tilted or inverted.

It is hoped that by going through the examples above, the requirement of innovativeness in the nominated idea/innovation, would be clear.

CHAPTER III

MAKING CHILDREN OBSERVANT

"Imagination is not only the uniquely human capacity to envision that which is not, and therefore the fount of all invention and innovation. In its arguably most transformative and revelatory capacity, it is the power to that enables us to empathize with humans whose experiences we have never shared".

J. K. Rowling

Identifying a hitherto unaddressed problem is the first step towards an innovative solution.

1. How can Children Identify Problems?

a) By observation of surroundings

In our daily lives, we normally see a lot of things, at times there is more to something than meets the eye. Thus sometimes, observing even the seemingly normal things can help us identify a problem to be worked upon. Observe how people go through their daily routine, observe nature and discover the details you and others may overlooked earlier.

b) Watch for inconveniences

Inconveniences or discomfort are clear signs of problems. Many activities that otherwise appear 'normal' may not at all be worthy of all that pain or drudgery. Try keeping four bricks on your head only for a minute. If you think it will be painful, recall a laborer at a construction site carrying six or eight bricks on his/her head. Now do you think this as a problem- a problem you never thought existed? Such problems are the opportunities for future innovations.

c) Watch for possible gaps

Sometimes we are so accustomed to see or do things in a certain way that we do not view it as inconvenient. If the device or process currently being used is sub-optimal, there exists a chance for innovation. The gap between the present and the future itself provides a scope for improvement or innovation.

d) Follow technology trends

One should always closely follow the new and emerging trends in technology and update oneself with the latest developments in relevant fields. This helps expand one's horizon, ascertain possibilities and makes it easier to spot possible gaps for improvement.

2. Brainstorming or Conceptualizing Possible Solutions

Brainstorming is a group creativity technique used to generate a large number of ideas for the solution to a problem. The process itself can boost morale, enhance work enjoyment, and improve team dynamics. Conceptualizing is a gathering imagination strategy used to create countless thoughts to answer an issue. The procedure itself can support resolve, upgrade work delight, and improve group elements.

After this brainstorming session, children can :

- Describe and apply the “rules” of brainstorming.
- Use brainstorming as a strategy to produce countless thoughts.

3. Use Design Thinking

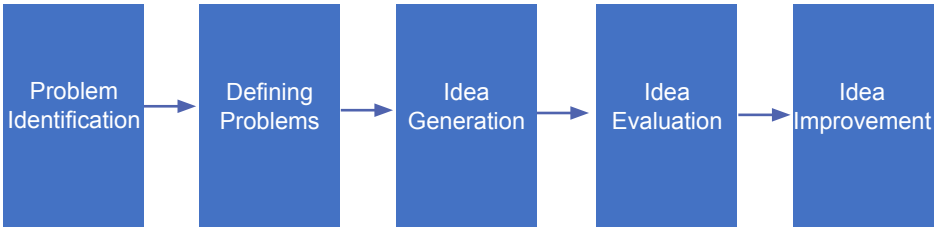
The design thinking process is a framework for creativity and innovation. It allows students to break down complex problems based on various stages:

The initial step of configuration thinking process is:

a) Problem Identification: Identifying a problem is very important. Essentialness and extent of the issue ought to be plainly distinguished.

b) Defining Problems: Deeper comprehension of issue will help in organizing it appropriately. Issue can be characterized outwardly utilizing pictures, graphs and stream diagrams or verbally by depicting the issue in words.

c) Idea Generation: Once the issue is recognized, different ideas are created to tackle the issue.



d) Idea Evaluation: Various ideas created are then assessed. Step by step instructions to assess the ideas and dispense with the infeasible ideas. These ideas are assessed on specific rules and weightage is given to them. The best idea which satisfies the problem is picked.

e) Idea Improvement: The ideas and thoughts are additionally improved depending on the accessible conditions.

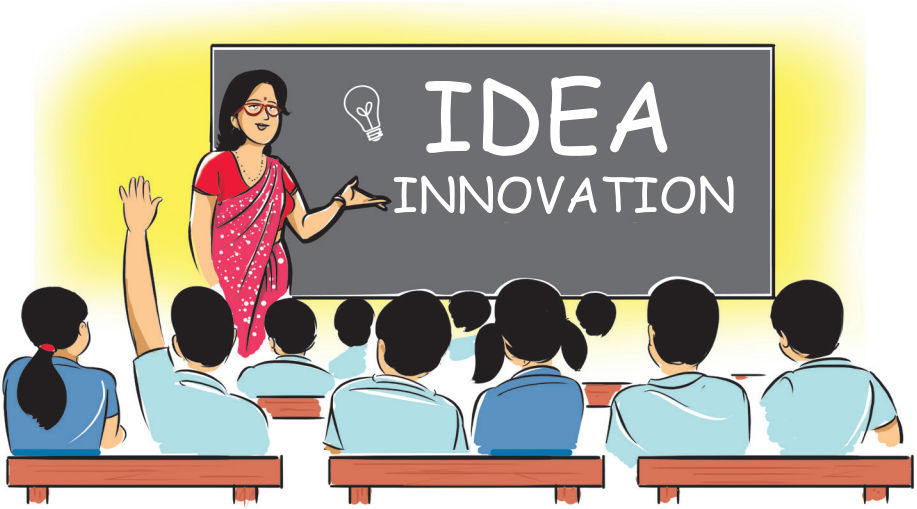
All of these strategies are ways to form innovation and inspire creativity in the classroom.

CHAPTER IV

HOW TO CAPTURE CHILDREN'S IDEAS – IDEA COMPETITION

"The true sign of intelligence is not knowledge but imagination".
Albert Einstein

1. Conduct an Idea Competition



To organize idea competitions, you may assemble them in a group and ask them to think about any or all of the following:

An idea of a machine or a gadget, which is not available but the student desires to have such a machine or a gadget.

An idea of improvement in any existing/available machine or gadget, so that it becomes multifunctional, efficient, reduces drudgery etc.

Any idea or an innovation that can solve a local technological problem, which a student may be seeing everyday around her/him.

Then ask them to write down their ideas in a piece of paper and submit it to the teachers.

These ideas can be further shortlisted by Principal/Head-master of the school.

2. Encourage Observation Skills

- Observe people from different background in different situations.
- Observe the problems faced.
- Encourage students to come up with complete solutions that address different dimensions of the problem.

CHAPTER V

LIST OF CHALLENGES AS SUGGESTIONS

"Takeup one idea. Make that one idea your life, think of it, dream of it, live on that idea, let the brain, muscles, nerves, every part of your body, be full of that idea, and just leave every other idea alone. This is the way to succes".

Swami Vivekananda

When we look around us we observe many things. There are many things which look usual on the surface and in nature but have some hidden opportunities behind them. So we should open our eyes to observe even the seemingly normal things. Observe how you and other people do routine, observe nature and discover the details you and others overlooked.

The list of challenges are numerous, but few which we observed are:
(Examples include but are not limited to the following :)

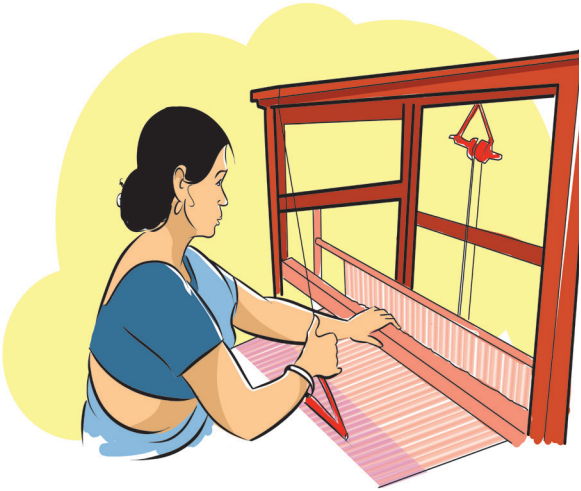
- Suitable assistive aids for physically challenged people to help in their everyday life.
- Suitable assistive aids for the elderly to help in their everyday life.
- Low-cost innovative tools for harvesting various crops, especially for hilly regions or remote areas were modern agri tools/ machines are not available.

- Ideas to help visually impaired people manage their day to day activities.
- Use of touch-free techniques for sanitation in community toilets, schools, railway stations etc.
- Instruments to cleanse fruits and vegetables and aseptic ways of food preservation and packaging.
- Addressing household issues related to cooking, and maintaining hygiene at home.
- Original assistive aid's for carrying load in hilly regions.
- Prevention of water pipe breakage during freezing temperature in cold regions. Novel ways to clean snow from roads and houses.
- Brand new alternatives to assist handloom workers, handloom industry, home tailoring etc.
- Safety devices for labourers working in hazardous working environments like bangle industry, cement industry, mining etc.
- Helpful devices for the Fisherman, Beekeeper.
- Creative devices to identify roads, manholes, pit holes during flood.

Safety devices for labourers working in hazardous working environments like bangle industry, cement industry, mining etc.

Suitable assistive aids for physically challenged people to help in their everyday life.

Brand new alternatives to assist handloom workers, handloom industry, home tailoring etc.



Creative devices to identify roads, manholes, pit holes during flood.

1. Guide Students with Tools and Methods to Find a Solution

Capture every idea

- Suggest student to carry a capture tool wherever they go to instantaneously note down the ideas to avoid forgetting the idea.

Create a master list of problems

- Ask student to collect the problems at one place and classify them based on required criteria.
- Classification will help students in comparing the potential of problems.

Review students master list of problems

- Review students master list of problems every now and then.
- See all the opportunities students have.
- Take one or two problems to work with.
- The best problems to look into are those which are unaddressed and solvable.

Take action

Take action based on the problem chosen to provide a solution.

Good observation will give a head start in coming up with a solution.

2. Idea Box

Teachers can keep an idea box in the school so that children can put their ideas in the box round the year. By this way school will get many new ideas.

CHAPTER VI

STUDENT'S IDEA EVALUATION CRITERIA

"The value of an idea lies in the using of it".
Thomas Edison

The teachers may also look up EMIAS portal (http://www.inspireawards-dst.gov.in/UserP/inspire-downloads.aspx) to see if the idea/innovation being developed by their wards have been not recognized already. This will help ensure originality and maintain the standard of the competition.

While selecting the idea the school should bear in mind the degree of novelty of the idea, its social applicability and end use, environmental implications, potential impact, scope for diffusion through commercial and/or non-commercial channels, relevance to existing government schemes etc. The selection criteria will be based on innovation, creativity and novelty of the idea/innovation that a student proposes to undertake, as submitted in the synopsis.

1.Before Nominating the Idea a Prior Art Search Can be Done by Student

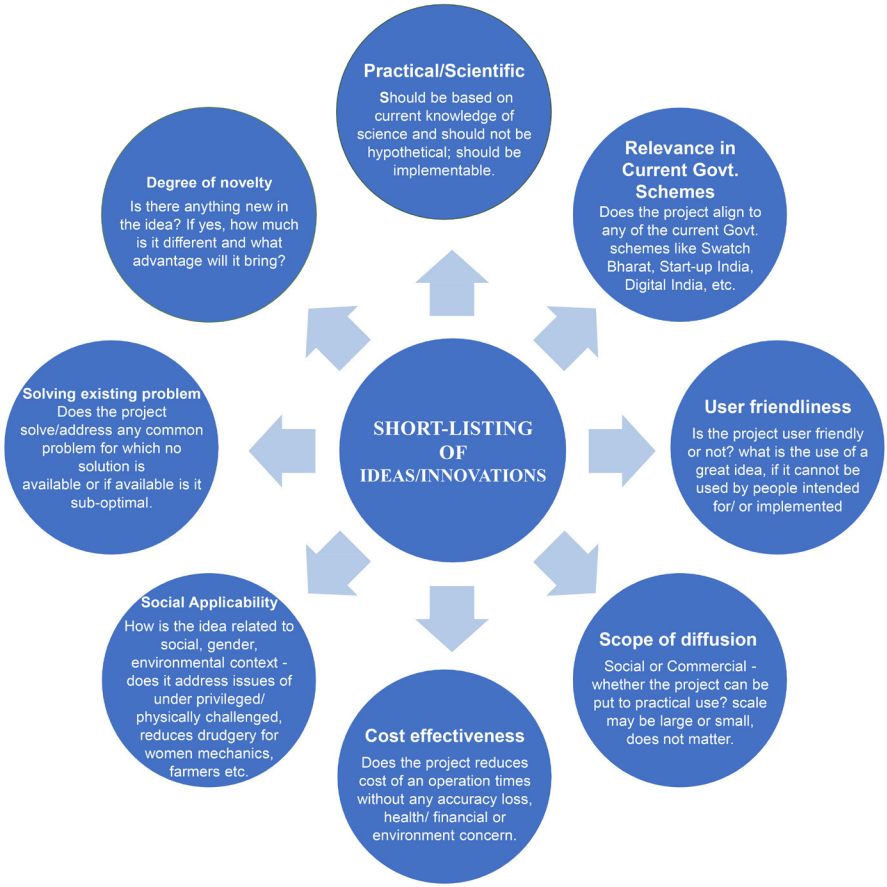
What is prior art search?

'Prior art' comprises all matters available to the public before the date of an innovation, through written or oral description or by use or by any other method. Any search done for identifying such prior art is known as prior art search.

As an innovator, do I need to do a prior art search?

Definitely yes. A prior search can help you prevent reinventing the wheel. A good prior art search will help you identify the real state of technology in the area of your innovation and you will be able to divert your attention to unattended areas or areas that require further refinement. It will also act as a navigator to identify the real scope of value addition, product development, and protection of intellectual property rights, business development, and diffusion through commercial or non-commercial channels of that innovation.

2. Short-listing of Ideas/Innovations:



3. Concluding Note

It is hoped that you would have found this handbook useful and the content informative and relevant.

Most important things to note are the requirement of an innovative idea for the INSPIRE-MANAK competition and the *evaluation criteria*, which is to be kept in the mind before nominating student ideas. It is hoped that teacher will now engage with their students more productively to bring out the best in them. Their creative potential can be properly harnessed by inculcating observation and problem solving abilities in them.

Through your support, INSPIRE-MANAK not only seeks maximum number of entries (5) from your school but also with a good degree of novelty and innovativeness.

4. Feedback and suggestions

If there is something, which you still like to be elaborated or clarified, please share your valuable feedback to us on our email ID: *inspire@nifindia.org*. Please mention the subject of email as: *Inputs to Teachers Handbook for nurturing student's ideas*. Your feedback and suggestions will be much appreciated.

INSPIRE-MANAK on the Web

Appendix - I

All information related to INSPIRE-MANAK competition can be found at the following link or by scanning the following QR Code

http://www.inspireawards-dst.gov.in/UserP/index.aspx

E-MIAS (E-Management of Inspire -MANAK)	Facebook	YouTube	Twitter	Instagram

Quick links related to INSPIRE -MANAK

Appendix - II

1. **To register or login into the School Authority click below**
   http://www.inspireawards-dst.gov.in/UserP/school-authority.aspx

2. **If you have forgot the school application number or registered email ID in Inspire EMIAS portal, click directly on following link**
   http://www.inspireawards-dst.gov.in/UserP/Check Application Number AndEmailid.aspx

3. **To download the system generated certificate of student selected in INSPIRE-MANAK**
   http://www.inspireawards-dst.gov.in/download/guidelines-certificate-download.pdf

4. **To check the status of award money (₹ 10,000) received by student**
   http://www.inspireawards-dst.gov.in/UserP/update-bankdetails-error-pfms.aspx

5. **In case the student has not received the award money and transaction has resulted in PFMS failure, the school can update the bank details in portal by following the guidelines mentioned**
   http://www.inspireawards-dst.gov.in/download/guidelines-to-update-Bank-Details-incase-error.pdf

6. **The school can check the idea/innovation nominated by student using following link**
   http://www.inspireawards-dst.gov.in/download/guidelines-to-project-nominated.pdf

7. **How to nominate students and how to register school in portal is explained in the user manual**
   http://www.inspireawards-dst.gov.in/download/manual/E-MIAS-Manual-Eng.pdf

8. **Guidelines to recover username and password is explained in following links**
   http://www.inspireawards-dst.gov.in/download/manual/Recover-User%20ID-Password-Eng.pdf

   http://www.inspireawards-dst.gov.in/download/manual/Recover-User%20ID-Password-Hin.pdf

9. **How to conduct idea conduction**
   http://www.inspireawards-dst.gov.in/download/manual/Idea-Competition.pdf

10. **The kind of ideas which will not be encouraged**
    http://www.inspireawards-dst.gov.in/download/manual/what-kind-of-ideas-will-not-be-encouraged.pdf

11. **How to write title of idea/innovation and synopsis**
    http://www.inspireawards-dst.gov.in/download/manual/Title-Project-Synopsis-Eng.pdf

12. **To know about INSPIRE-MANAK programme**
    http://www.inspireawards-dst.gov.in/download/manual/INSPIRE-Awards-MANAK.pdf

National Innovation Foundation - India

Autonomous Institute of the Department of Science & Technology, Govt. of India

Making a Creative, Compassionate and Collaborative India

Over the last twenty years, adding a few thousand entries every year, NIF has pooled a database of over 3,30,000 technological ideas, innovation in traditional knowledge practice (not all unique, not all distinct) from over 610 districts of the country. In collaboration with various R&D and academic institutions, agriculture and veterinary universities, and other institutions, NIF has helped in getting over 1,600 grassroots technologies validated and/or value added. Under the NIF-ICMR (Indian Council of Medical Research) collaboration, over 1,400 herbal human health related unique leads have been shortlisted for validation, of these 96 practices in 8 disease areas have already been validated at various institutes and Clinical Research Organisations (CROs).

NIF has filed 1,336 patents (In India and 28 Patent Cooperation Treaty applications) in the names of innovators and outstanding knowledge holders. Of these, 507 have been granted in India and 5 in the USA. NIF also has applied for 23 design registrations and 10 trademark applications. The applications for 81 farmers' developed plant varieties have also been filed at the Protection of Plant Varieties & Farmers' Rights Authority (PPV & FRA, India), of which 29 have been registered.

Receiving hundreds of inquiries for grassroots innovation from 110 countries, NIF has succeeded in commercializing products across six continents, apart from materializing 130 cases of technology licensing. NIF has set up a Section 8 company, NIF Incubation and Entrepreneurship Council (NIFientreC), a Technology Business Incubator with DST's support. Seventeen grassroots innovation-based enterprises have been registered as start-ups recognized by Department for Promotion of Industry and Internal Trade (DPIIT) as a part of incubation activity under NIFientreC. In addition to the efforts for commercialisation, NIF also undertakes programs for social dissemination/ diffusion of innovative technologies and practices for the benefit of the society at large.

To recognize, respect and reward the creativity of grassroots innovators, outstanding traditional knowledge holders, children and local creative communities, NIF organises national biennial competitions for grassroots innovations and outstanding traditional knowledge. NIF has till date recognised 1,013 grassroots innovators, outstanding traditional knowledge holders,

communities and school students at the national level in its various Award Functions.

NIF is increasingly seen as a pivot of many national programs that promote innovation in different sectors of the economy and at various levels in the society. Since 2015, NIF has been supporting the President's Secretariat in organising the Festival of Innovation and Entrepreneurship (FINE). Aligned with the 'Start-up India' action plan, the INSPIRE – MANAK (Million Minds Augmenting National Aspiration And Knowledge) scheme for school students is being jointly executed by the Department of Science and Technology (DST), Government of India and NIF. Under the scheme, in addition to the monetary support to the students for their innovative ideas, and selection at the district, state and national level, NIF incubates the top 60 innovations of the students.

All information related to the NIF-India can be found by scanning the following QR Code

Publisher:

National Innovation Foundation –India
An autonomous institute of Department of Science and Technology, Govt. of India

million minds augmenting national aspiration and knowledge

inspire manak

Inspiring Innovators of Tomorrow

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