

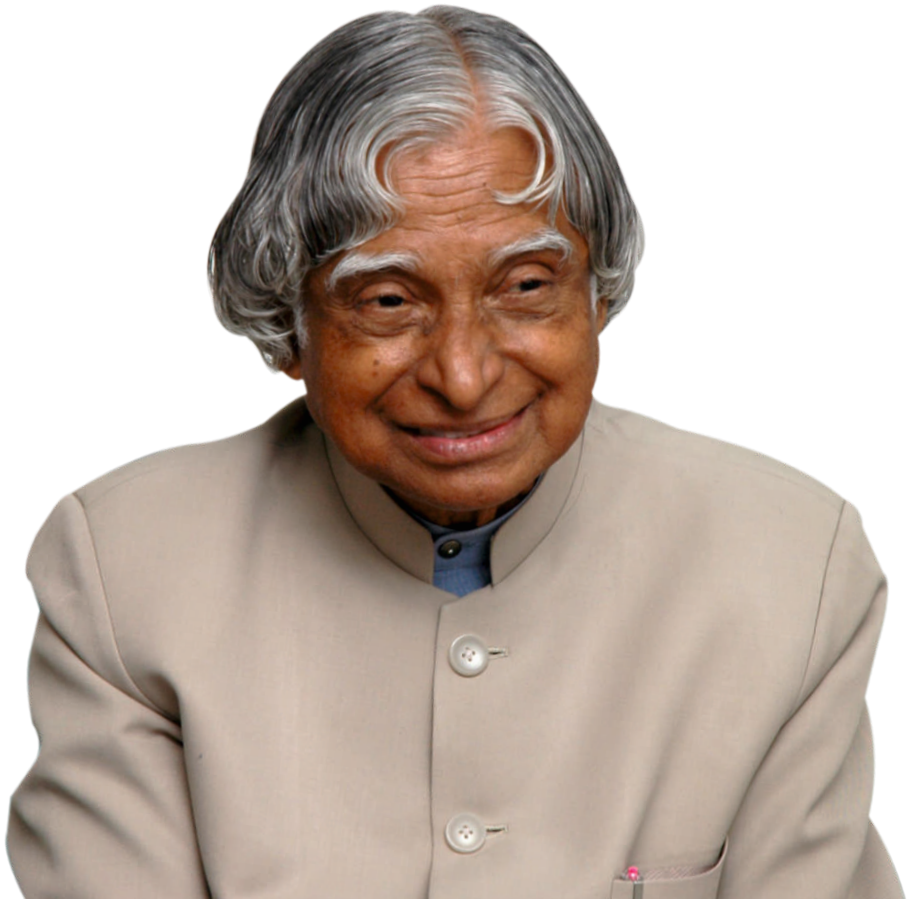
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Autonomous Body of the Department of Science and Technology, Govt. of India





**Dr APJ Abdul Kalam IGNITE Awards at the hands of the  
Hon'ble Former President Shri Pranab Mukherjee  
November 17, 2018**



**Remembering Dr APJ Abdul Kalam  
Former President of India  
1931-2015**



# Preface



**Dr P S Goel**

Chairperson  
National Innovation Foundation-India

I am honored to write this preface for the Dr APJ Abdul Kalam IGNITE 2018 Award book profiling the year's young student innovators. The recently concluded Dr APJ Abdul Kalam IGNITE campaign demonstrates yet again the tremendous creative potential our children have. NIF was able to mobilize thousands of ideas from every nook and corner of the country, which itself is a big achievement. On November 17, 2018, our former President Shri Pranab Mukherjee will be giving away the awards to the most creative thirty one students. I sincerely thank him for his continued support to NIF and for motivating the young creative minds of the country. I am happy that NIF will develop prototypes of the students' ideas, file patents in their names and take their innovations to society through commercial or non-commercial channel, wherever applicable. This is something that will be most motivating for the children and many more will be inspired in the years to come.

The IGNITE has given a great platform to the young students over the years. Many of them have won prestigious awards like IMC Inclusive Innovation Award and NCPEDP-Mphasis Universal Design Award. Many of them have been selected as the Innovation-Scholars-in-Residence of the President House. Some of have represented India at international platforms like BRICS Young Innovator competition and ASEAN India Grassroots innovation competition and won appreciation and awards.

This is matter of pride to share that IGNITE award winners have been invited as TEDx and INK speakers as well. This proves that the process of identifying young creative talent by NIF is so rigorous and robust that the world also takes notice of their interesting work. I am looking forward to such stories of continued success from this year's award winners as well.

I also hope they will continue to remain as creative during their further studies and later in the career as well. In future, our country would need diverse and creative approaches to address the many problems we have and would have, the creative children who will become the leaders tomorrow are our best bet for the country.

In the end, I congratulate all the IGNITE award winners and compliment the NIF staff for working hard to give the children this platform and opportunity.

With my best wishes to all

PS Goel



सत्यमेव जयते

प्रो. आशुतोष शर्मा  
Prof. Ashutosh Sharma



सचिव  
भारत सरकार  
विज्ञान और प्रौद्योगिकी मंत्रालय  
विज्ञान और प्रौद्योगिकी विभाग  
Secretary  
Government of India  
Ministry of Science and Technology  
Department of Science and Technology

### FOREWORD

I am very happy to note that the Dr APJ Abdul Kalam competition has grown by leaps and bounds over the last decade. From a mere 961 submissions from 19 States and Union Territories (UTs) in 2008 to over 90000 from 36 States and UTs in 2018 is a tremendous achievement. I am told that NIF was able to reach and mobilize submissions from 643 districts of the country, which is about 90 per cent of the total number of districts of the country. Children from remote areas like Leh in Jammu and Kashmir and Longding in Arunachal Pradesh have also found a place in the list of the award winners. I compliment the team NIF for working hard to ensure the participation of young students from all parts of the country. Many of the ideas selected for recognition this year appear very interesting and promising! I hope NIF will be able to take them forward in the most appropriate way.

NIF has also brought a lot of energy at the ground level working with the Department of Science and Technology (DST) to facilitate its INSPIRE MANAK (Million Minds Augmenting National Aspiration and Knowledge) program for school children. I am happy that through the outreach programs and workshops, more awareness is being generated among the schools and students. I am very hopeful that through sustained efforts NIF and DST will be able to bring a large number of schools across the country onboard for the program.

I am also expecting that within a couple of years, we are able to launch a few products based on children's ideas in the market thereby completing the value chain. Justice to the creativity of the children can only be done when we take their ideas to their logical conclusion. This is the way through which more and more children will be motivated to come up with creative, innovative and ingenious solutions. NIF has, in the past, helped diffuse students' innovations both through commercial and non-commercial channels. Student innovations like walker with adjustable legs, crutches with shock absorbers, garbage picking and disposing machine have been commercialized. This journey from mind to market completes what is known the 'Inverted Model of Innovation', which implies that children will ideate, engineers will fabricate and companies commercialise. All eligible cases are expected to undertake this journey.

My hearty congratulations to all the award winners and compliments to their parents and teachers for the support provided to their wards. I sincerely hope that some of these young students go on to undertake an enterprising career in science and technology, developing and deploying useful devices and gadgets for the betterment of the society.

With my best wishes

(Ashutosh Sharma)



# Director's message



**Dr Vipin Kumar**

Director and Chief Innovation Officer  
National Innovation Foundation-India

It is my great pleasure to welcome and greet the 2018 cohort of the Dr APJ Abdul Kalam IGNITE Awards winners. This year thirty one winners come from eleven states of the country with twenty one being the total number of awards. I am happy to state that due to the efforts of hundreds of volunteers across the country we have participation of and award winners from interior, backward and remote areas of the country. Overall about 90,000 submissions of students from 643 districts of all the States & Union Territories of India were received during the one year competition period of the IGNITE 2018 competition.

NIF continues to be guided by the vision of our former President, Bharat Ratna Dr APJ Abdul Kalam who had patronized the IGNITE campaign and motivated the young students to think big. "To think small is a crime", he had always told them. Our former President, Shri Pranab Mukherjee ji, during his Presidency, furthered this legacy by giving award to the children and hosting one award function in the Rashtrapati Bhavan. He continues to encourage us and will be giving away the awards to the children on the November 17, 2018 at Gandhinagar. I express my heartfelt gratitude to our former President for continuing to engage with the creative children of our country and motivate them.

My sincere gratitude to our Hon'ble Minister of Science & Technology and Earth Sciences, Dr Harsh Vardhanji for his continued support and guidance to NIF. I am also grateful to Dr PS Goel, Chairperson NIF, Prof Ashutosh Sharma, Secretary, DST and NIF's Governing Board Members for their faith and support to NIF.

Dr APJ Abdul Kalam IGNITE competition is organized by NIF in association with the Central Board of Secondary Education (CBSE), Honey Bee Network, and other partners. A number of other State Boards/Councils/ Directorates/Departments of Education/Secondary Education/ Higher Secondary of Uttarkhand, Tripura, Punjab, Nagaland, Maharashtra, Haryana, Manipur, Tripura, Arunachal Pradesh, Tamil Nadu, Himachal Pradesh, Karnataka, Madhya Pradesh, Assam, West Bengal Council of Rabindra Open Schooling, Chhattisgarh Sanskrit Vidyamandal, Rashtriya Madhyamik Shiksha Abhiyan – Chhattisgarh, and State Councils/Institutes of Education Research and Training of Telangana, Andhra Pradesh, Rajasthan and Karnataka also actively promoted the IGNITE 2018 campaign. I sincerely thank the contribution of all of them to the campaign. Shri Hari Om Ashram, Surat needs special mention for constituting the Poojya Mota Prerit awards at NIF for best student ideas and for the children coming from tribal and far-flung areas.

My colleagues at NIF deserve commendation for their untiring efforts to make the IGNITE campaign a great success. I compliment and congratulate the award winners once again and hope they will bring laurels to our country in the future.

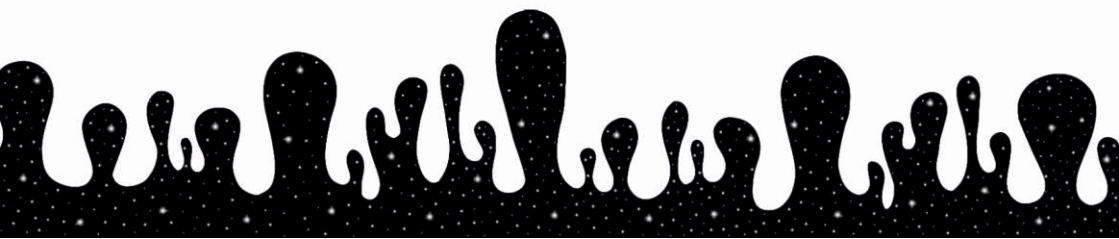
With my best wishes and regards to all

Vipin Kumar



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## **Biodegradable water bottle using local materials**

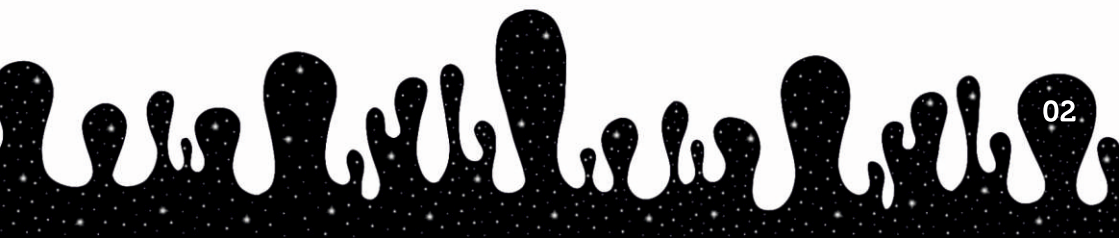


**Anushka Shrivastava**  
**Class 6**  
**Bhopal, Madhya Pradesh**

Having read that reusing plastic water bottles may cause cancer, Anushka thought about making her own eco-friendly water bottle. In her bottle, she has used two layers of coir with sphagnum moss in between and with khuss inner lining. A mixture of urad daal, jaggery and vinegar has been used as binder. Coir makes the bottle water resistant, the moss layer acts as an insulator, and khuss layer keeps the water fresh for a long period of time.

She likes playing badminton, instrumental music and table tennis. She has a keen interest in particle and quantum physics and wants to become an astrophysicist when she grows up. The quote that motivates her is, "To achieve something you have to dream first".





## **Life jacket with an oxygen mask**



**Mauwang Wangham**  
**Class 4**  
**Longding, Arunachal Pradesh**

The young student has given an idea about a life jacket with an attached oxygen mask so that it may be used as and when required especially in case of an emergency. Seeing a friend drown in a river and the helplessness of not being able to save him ignited this thought in his mind.

Mauwang enjoys playing, painting and writing, and wants to become a scientist.



## Single multipurpose geometric instrument



**Sushil Sahu | Antareep Ray**

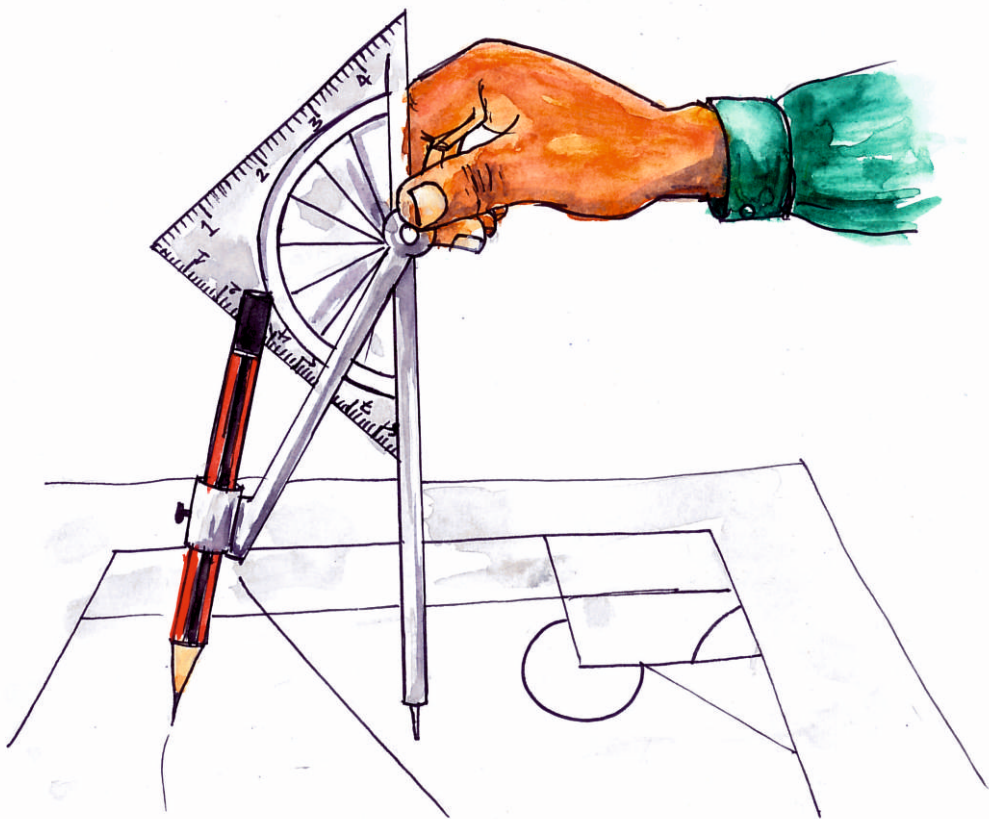
**Class 4 | Class 7**

**Bargarh, Odisha | Agartala, Tripura**

To simplify keeping, carrying and using geometric instruments, Antareep and Sushil have suggested a simple idea of developing a single instrument using which all basic geometric requirements can be fulfilled. The students conceived this idea individually to make a single geometrical instrument which will be convenient to use, keep and carry.

Sushil has a keen interest in machines and wants to become a mechanical engineer. He also likes playing with toys and broken machines. Antareep likes to draw, along with studying science and math. He wants to become a doctor and treat people free of cost.





## **Animal carcass picking machine**



**Tarunendra Tyagi**  
**Class 7**  
**Rewa, Madhya Pradesh**

Animal carcass left unattended on roadsides start decomposing emitting stench and posing infection risk. Tarunendra has ideated about a machine, which can easily pick up the carcass for appropriate disposal eliminating the risk of any infection. This idea came to his mind after watching decomposing carcass of dead animals lying on roads in his village for days.

He likes his studies and wants to become an IAS officer so that he can control corruption.



## **Tactile cum Braille signage to help visually challenged in public buildings**



**Supriya Jagadala**  
**Class 8**  
**Bhubaneswar, Odisha**

Supriya, a visually challenged girl herself, has suggested using tactile and braille signage for the visually challenged in the hospitals. Facing the problems herself she got the idea. She likes to play cricket and aspires to take it up as a career later.





## Visually challenged friendly navigation facilitation system



**Lina Swain | Purba Biswas | Rahul Biswal**

**Class 8 | Class 12 | Class 12**

**Bhubaneshwar, Odisha | 24 South Parganas, West Bengal |  
Bhubaneshwar, Odisha**

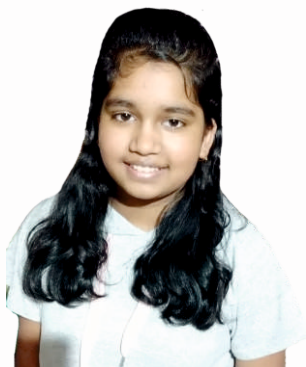
To help the blind people walk around easily, the idea of students is to have navigation poles across the city to help the blind move around freely. The poles are identified through sensors and have tactile/ braille signage for directions as well as audio instructions. They also suggest incorporating three different musical tones in traffic light system for the three lights, which helps the blind identify the correct traffic signal. They also want smart guiding tiles on all walkways and at crossroads so that they can feel the grooves in the tiles with their sticks and navigate easily.

Lina has a lot of interest in blind cricket tournaments, reading books and using computers at leisure time. She had taken an initiative to form a blind women cricket team and has also won Man of the match awards several times. She wants to be an athlete, a cricketer and a good teacher. Purba likes listening to different kinds of music, and is a trained classical dancer. She wants to be an IPS Officer and work against eve teasing & corruption. Rahul likes swimming and playing lawn tennis. He is a national level air rifle shooter and aspires to become a pilot.





## Automatic fungus/algae cleaning machine



**Sneharakhi Apat | Mohi Diwan**

**Class 8 | Class 11**

**Bhubaneswar, Odisha | Hoshangabad, Madhya Pradesh**

Fungus growth is often seen on walls during monsoons. Not only these spoil the aesthetics of the room/home but are harmful for the health too especially for people with allergy or asthma. Sneharakhi's idea is to develop a device that can scrap and suck the green algae growing on the walls of home, in pathways and other places. Mohi suggests having a machine, which can clean the fungus automatically.

While Sneharakhi likes painting and wants to become a doctor when she grows up. Mohi enjoys dancing and wants to become a civil servant so that she could serve the society.



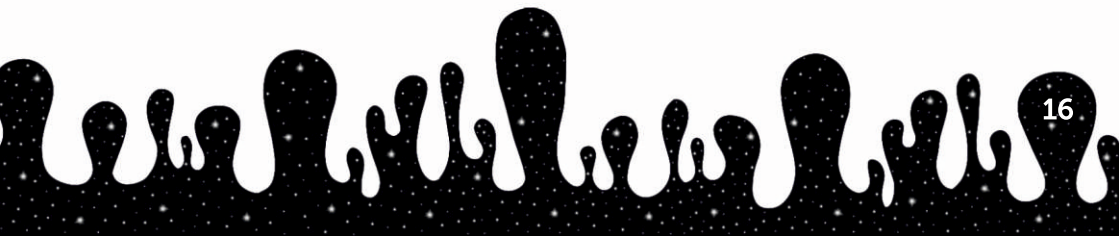
## Multipurpose tool for agricultural use



**Sneha Chakraborty**  
**Class 8**  
**Khowai, Tripura**

In order to help her grandfather who struggles managing a variety of tools for agricultural purposes, Sneha has given an idea of a multipurpose tool with eight attachments, which are useful for gardening, harvesting and for house-hold use. Her idea is to have a hollow cylinder handle, where eight different attachments can be kept. Depending on the nature of work, suitable attachment may be taken out and mounted on the handle. This idea can help a lot of other people too, especially living in a country where the majority practice agriculture as their main livelihood.

Sneha likes painting, surfing internet, listening to music and reading books. She wants to take up research as a career in future, particularly in the field of medical sciences, or to become a doctor and give free of cost treatment to poor people.





## Fall alert alarm in bathroom

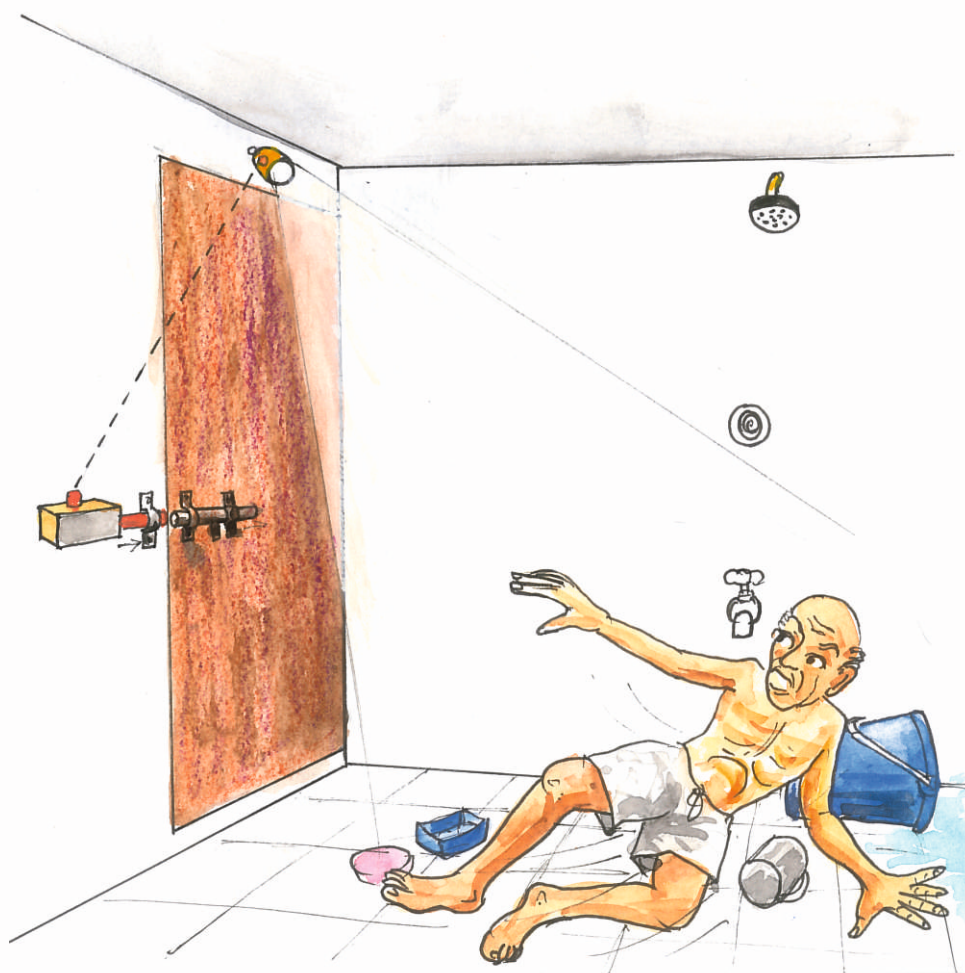


**Kiran Choudhury | Adyasha Priyadarshinee Rath**  
**Class 9**  
**Bhubaneshwar, Odisha**

Their idea is about a sensor based system installed in the bathroom, which alerts family members if an elderly falls down in the bathroom and may not be in a position to unlock/ open the door. They observed that elderly people in bathrooms are in constant fear of slipping and getting fatal injuries. As they cannot call out for help this leads to late treatment and chances of death.

Kiran likes to read novels and listen to music, while Adyasha likes dancing and painting. They both also play kho-kho and both of them aspire to become a doctor in future.





## Doorbell triggered vibration alert in pillows



**Dasmat Murmu**  
**Class 9**  
**Khurda, Odisha**

Dasmat suggests that there should be a connection between doorbell and our pillow, so that if there is a bell, which gets missed somehow, still the alert can be had through vibration in the pillow. He further adds that this alert system can also be converted into a small wrist wearable device, so that it can be worn while working in kitchen or other corners of house or backyard far from the audible range of doorbell.

He likes painting, writing essay, playing cricket and football. Idolizing Dr. APJ Abdul Kalam, he wants to become a doctor and serve the people.



## **Bamboo basket weaving machine**



**Sumit Murari**  
**Class 10**  
**Bokaro, Jharkhand**

Bamboo basket weaving is a time and labor intensive task where weavers can hardly prepare 3 to 4 baskets in a day and thus earn very less. The idea behind this machine is to boost the production so that earnings can be maximized drudgery reduced.

Sumit loves playing sports, reading books, painting and storytelling. He wants to become a nuclear weapon scientist in order to strengthen the nuclear power of India.





## Smart cervical collar



**Digantika Bose**

**Class 10**

**Purba Bardhaman, West Bengal**

The smart cervical collar is an improvisation in the original collar where a small fan at the front is attached. The fan serves to regulate the temperature and humidity in the gap between the neck and the collar. An additional air channel has been provisioned to allow fresh air to be released at the back of the neck. This idea is a result of her effort to help her grandmother who was suffering from cervical spondylosis.

She wants to become a scientist and work for welfare of under privileged people. She is highly motivated by the works and quotes of Dr. APJ Abdul Kalam.



## Low cost shellac processing technique

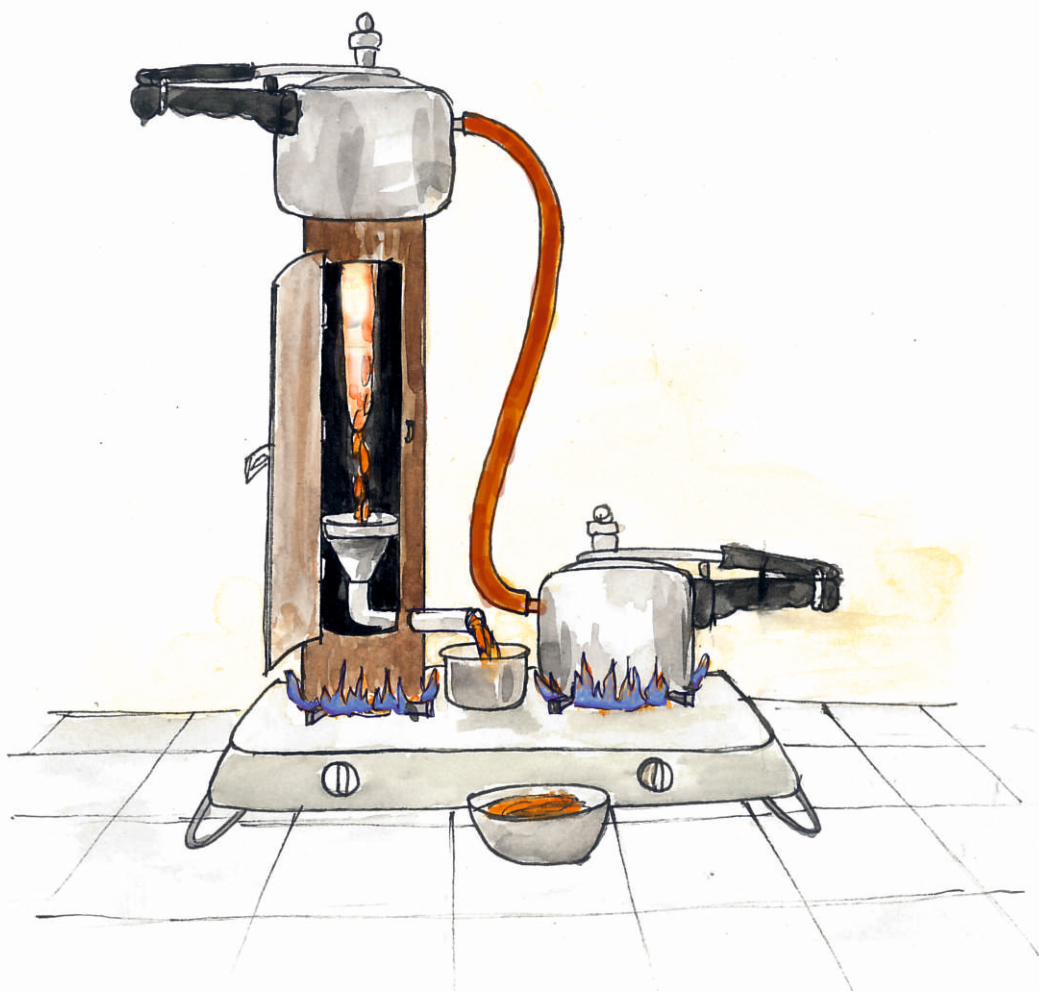


**Debangshu Kumar**  
**Class 10**  
**Puruliya, West Bengal**

The filtering process of shellac in traditional handmade method needs charcoal as a fuel. In large scale processing system the filtering is through hydraulic press. The present technique uses house hold items viz. pressure cookers, hollow cylinder, one double burner gas oven, one shuraksha gas pipe, cloth filter, etc. In this process steam produced in one cooker is transferred to another containing shellac (seed lac), which melts it. The wastage of heat in the traditional method of shellac processing where large quantity of charcoal is used gave him this idea.

Debangshu gets his motivation to work for the society from the famous quote of Helen Keller "Alone we can do so little, together we can do so much". He wants to grow up and become a rural industrialist.



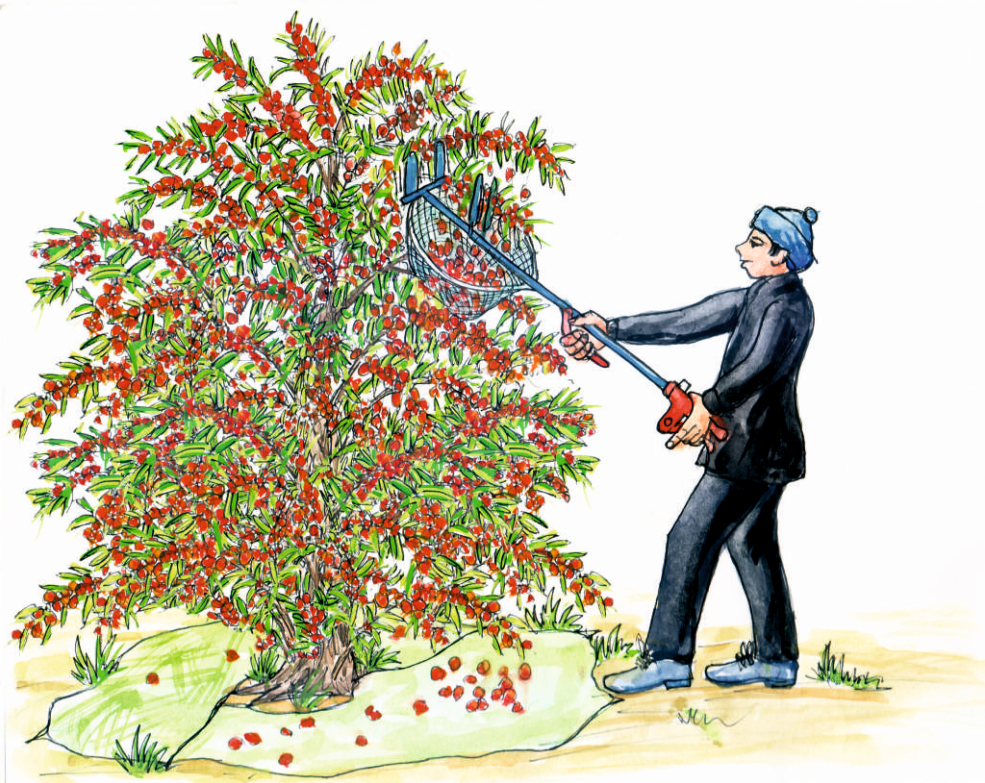


## Sea buckthorn harvester



**Tsering Omphel**  
Class 9  
Leh, Jammu & Kashmir

Tsering has suggested a low cost device for plucking of sea buckthorn fruits, which otherwise are hand plucked manually. People face great difficulty to harvest fruits due to its thorny branches. Many a times their hands get injured as well. A lot of fruits remain un-harvested due to failure to reach them by hands. This device can not only be easy to handle and time saving for them, but also reduces the wastage of fruits too. Tsering aspires to become an engineer.



## Low cost portable Chironji decorticator



**Indrajeet Singh**

**Class 11**

**West Singhbhum, Jharkhand**

Workers deseed chironji manually, which is time consuming and laborious. Indrajeet ideates about a portable low cost decorticator, which can be used by a small farmer easily. This machine may be manually operated or solar operated.

Indrajeet likes singing, playing guitar and keyboard, modeling and conceiving creative ideas. He wants to be a businessman, because he wants to launch his project ideas in market as products.





## Dustbin with trapped animal indicator



**Rohit Manavadiya**  
Class 11  
Gandhinagar, Gujarat

Monkey, squirrel, birds, etc., sometime get trapped in big dustbins while looking for food and are not able to come out. Rohit's idea is to have a device, which indicates if an animal has got trapped in the dustbin and alert people nearby to rescue it. He got this idea after seeing several reports of trapped animals on TV.

Rohit loves watching cricket, National Geographic Channel and other animal related channels on TV. He wants to become a bank manager and also wants to go abroad for higher studies.





## **Pesticide spray pump with mandatory protective mask**



**Parth Patel | Aditya Chauhan | Rohit Manavadiya | Jaydip Raval**  
**Class 8 | Class 6 | Class 11 | Class 9**  
**Gandhinagar, Gujarat**

The children suggest attaching a system in the spraying pump that does not allow pesticide to be sprayed if the farmer is not wearing a protective mask. The students got this idea during the field visit of children creativity workshop 2018 organized by SRISTI when they saw farmers spraying pesticides without protective masks.

Parth likes reading books and wants to become an engineer. Aditya likes to play badminton and wants to make up a career in agricultural research. Rahit loves watching cricket, national geography and other animal related channels on TV. He wants to become a bank manager and also wants to go abroad for higher studies. Jaydip likes to play kabaddi, sing and go on tours, and wants to become an engineer.





## Porter payment calculating device



**A J Surya | S Venkateswaran | K Harrish | Venuram R R**  
**Class 12**  
**Chennai, Tamil Nadu**

The students have given the idea of a device, which can calculate the exact amount of money to be paid to porter based on time put in, distance travelled and load carried. They always observed porters arguing with customers about what the amount needed to be paid to them. They also realized that people do not haggle or bargain over the fare shown by the auto or taxi meter. So, using the same idea in the first context, they thought of a device that can benefit both porters as well as the travelers.

Surya likes reading Dan Brown, play keyboard, and wants to become chartered accountant or an entrepreneur. Venkateswaran enjoys reading books (mostly fiction) and plays table tennis. He wants to make a career in biotechnology. Harrish likes listening to science lectures and wants to become a scientist like Dr APJ Abdul Kalam, and help people through science and technology. Venuram is good in cricket and archery, and has a keen interest in automobiles and plans to become a mechanical engineer.





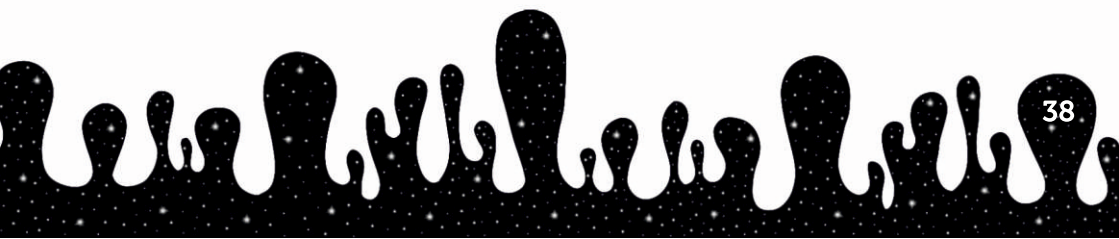
## **Assistive spectacles for the deaf with voice to text conversion and display feature**



**Madhav Ajay Lavakare**  
**Class 12**  
**Delhi**

This is a small smart spectacle that converts speech to text and displays it on the screen of the glass to enable a hearing impaired understand (by reading) what the other person is saying. The hearing-impaired community is often disregarded and isolated from mainstream society, and there is no accessible solution for them to easily integrate into the mainstream. This innovation is born out of a desire to solve this problem and to create an affordable, scalable, and inclusive solution to the communication gap between the hearing-impaired and the hearing-enabled.

Madhav is an avid tinkerer and maker, and loves to build things to solve problems. He is passionate about using technology with empathy to create an impact on society. He also loves to play the piano, football, tennis, and do coding. He wants to become an entrepreneur and start a company that creates products which can solve major problems and has a great impact on the society.





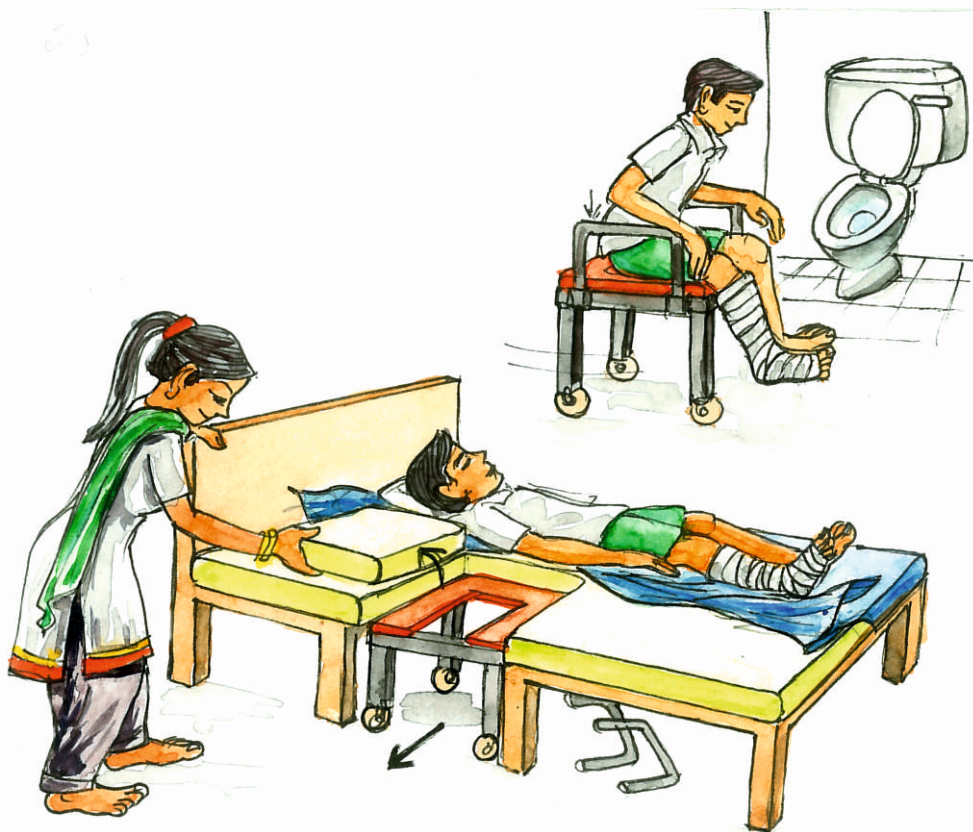
## **Innovative and low cost bed with detachable wheel chair**



**Arushi Tandon**  
**Class 12**  
**Kolkata, West Bengal**

Arushi has designed a modified bed where a wheelchair has been incorporated. With a few easy adjustments, this integrated wheelchair can be separated from the bed, thereby making it easy for the patient or bed ridden person to be moved. Moreover, this wheelchair is built to slide over the commode so as to eliminate another transfer. This idea is her effort to help her grandmother who was immobile.

Arushi is an athlete and plays the piano. She also writes poems and has published two books and received a scholarship from CCRT, Ministry of Culture for creative writing. She wants to study biology and biomedical engineering to further her work and develop such innovations.

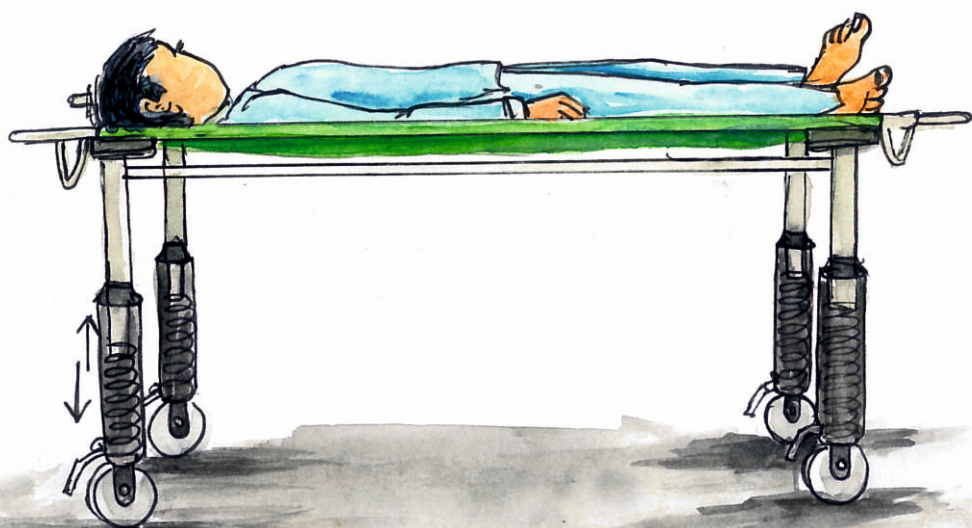


## Shock absorbing stretcher



**Hema Pradhan**  
**Class 12,**  
**West Sikkim, Sikkim**

Her idea is to have spring/ shock absorber supported stretcher so that the shocks/jerks while attendants are carrying a patient or keeping the stretcher down could be minimised. Hema, who likes to write poems, got the idea by witnessing the bad condition of roads in her village where travelling is very difficult.











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