Public Sector Development Program (PSDP)

"Launching of STEM in Pakistan, Phase-I (Revised)"

Request for Proposal for the STEM Teachers Training Activities Materials

September 2, 2024

Pakistan Science Foundation
(Ministry of Science & Technology)
Islamabad

Note: This document contains 60 pages, it is the responsibility of the bidder to check and confirm the complete RFP document at the time of procurement.

Pakistan Science Foundation
(Ministry of Science & Technology)
Islamabad
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STEM Teachers Training Activities Materials

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i. Tender Notice

Pakistan Science Foundation
(Ministry of Science & Technology)
Islamabad
Provision of STEM Training Activities Materials

Pakistan Science Foundation (PSF), the executing agency for STEM project invites to submit proposal/bidding documents online through EPADS portal of PPRA in **Single stage-Two envelop** procedure from well-reputed firms, suppliers, companies and manufacturers registered with the Security Exchange Commission of Pakistan (SECP)/other registration authorities, having names in Active Taxpayers List (ATL) of NTN and General Sales Tax (GST) for "**STEM Teachers Training Activities Materials**" as per mentioned in scope of work for 200 school teachers.

Bidding Documents containing detailed terms and conditions, method of procurement, procedure for submission of bids, bid security, bid validity, opening of bid, evaluation criteria, clarification for rejection of bids, performance guarantee etc. are available on PSF website www.psf.gov.pk for the interested bidders.

RFP documents carefully prepared and applied on EPADS (Federal) as per provided instructions on or before the closing date (i.e. after 15 days of this advertisement/ publication) by 11:00 am. The Bids will be opened on the same day at 11:30 am in the PSF Committee Room, in the presence (physical/online) of the applied bidders. The advertisement is also available on PPRA website at www.ppra.gov.pk.

Only EPADS (Federal) registered bidders can apply for the tender. Applications other than EPADS will not be considered and entertained. Unregistered bidders shall register on EPADS (Federal) first and then apply for the tender through EPADS.

Project Director (STEM)
Pakistan Science Foundation,
1-Constitution Avenue, G-5/2, Islamabad
Phone No.:- (051) 9201236

ii. Introduction

Pakistan Science Foundation
(Ministry of Science & Technology)
Islamabad
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PSDP "Launching of STEM in Pakistan, Phase-I (Revised)

STEM Teachers Training Activities Materials

1. Pakistan Science Foundation (PSF) is an autonomous body under the administrative control of federal Ministry of Science and Technology (MoST) and the executing agency for the Public Service Development Program "Launching of STEM in Pakistan, Phase-I, (Revised)", approved by the Departmental Working Party of MoST, Govt of Pakistan, Islamabad.

The main objectives of the PSF are.

- Promotion and funding of scientific research and related activities bearing the socio-economic needs of the country.
- Establishment of Science Centers, Museums, Herbaria & Planetaria.
- Promotion and Popularization of science through Mobile Science Exhibition, Science Fairs, Science Essay, Poster & Quiz competitions, Inquiry Based Science Education (IBSE), Popular Science Lectures and Establishment of Science Clubs in High Schools.

2. Launching of STEM in Pakistan, Phase-I (Revised): Primarily, the project is designed to achieve a knowledge-based economy by enhancing capacity of Government sector schools across the country. The major objectives of the STEM project are.

- To officially launch STEM, the modern tool for promotion of science and technology for Science, Technology, Engineering and Mathematics Education in Pakistan. In the 1st phase, the project shall be launched initially in 50 Higher Secondary Schools/Cadet Colleges, 5 Universities across the country, and 1 at Pakistan Museum of Natural History and PSF Science Center Faisalabad (each) making a total of 50 Mini STEM FABLABs and 7 Hi STEM FABLABs and 1 at PSF under STEM PSF Academy.
- To prepare a critical mass of science teachers as STEM mentors and Innovation Handlers, capable of harnessing the disruptive innovation coming out of FABLABS and transforming this phenomenon into socio-economic wellbeing.
- To introduce active learning methods that includes communication, collaboration, problem solving, leadership, creativity.
- To prepare the youth for meeting the incumbent technological needs and challenges facing the country by preparing 21st century workforce through STEM.

iii. Instructions

1. **Procedure for Proposal:** Interested and well-reputed firms, suppliers, companies, and manufacturers, registered with the Securities and Exchange Commission of Pakistan (SECP)/ other registration authorities and having names Active Taxpayers List (ATL) of NTN/IT and GST for "STEM Teachers Training Activities Materials" as per mentioned in scope of work for 200 school teachers. The Firm/bidder shall complete and carefully prepare the proposal documents and submit in accordance with instructions in RFP documents in all respects along with relevant documents as per PPRA rules.
2. **Procurement Process: Single Stage – Two Envelope** Bidding Procedure will be adopted for selection of the firms/lowest bidder for the subject tender. Bidders should submit online via EPADS (Federal). The proposals shall be opened the proposal on the date and time mentioned in this tender document. Proposals and bids should be submitted in two separate envelops with the titles as "Technical Proposal" and "Financial proposals", which should be enclosed in a single envelop with clear heading **"STEM Teachers Training Activities Materials"**. Initially technical proposals will be opened at the date and time mentioned in the tender notice. While the financial proposals of only technically qualified firms would be opened later on date and time in this regard would be communicated. All the received proposals will be evaluated, and no amendments or changes will be allowed in the proposals after opening.
3. **Mode of submission of documents:** The proposals should be submitted online through EPADS (Federal) within its stipulated closing date and time on or before 15 days of the advertisement of this tender. Phone: - (051) 9204033.
4. **Opening of online submitted proposals**: The received proposals through EPADS will be opened by the authorized committee (STEM Procurement Cell) on the same day in the PSF Committee Room, in the presence of the bidders who want to participate. Representatives present in the tender/bid opening meeting shall be marked on a physical/online attendance sheet evidencing of their presence. If any holiday is announced by the Government of "Force Majure Situation", the tender/bid will be opened on the next working day or as intimated by the PSF.
5. If a proposal is not substantially aligned to the terms & and conditions/particulars of this document, it will be rejected by PSF and may not subsequently be made responsive by the firm by correction of the non-conformity. A proposal once opened in accordance with the prescribed procedure shall be subject to only those rules, regulations and policies that are

in force at the time of issue of notice for invitation of proposals.

6. Bidders/Firms will be informed, in due course, of the result of the evaluation of bids.
7. **Bid Evaluation Criteria:** Tender would be awarded to the firm, which confirms and complies with all the terms conditions, specifications and has quoted the lowest price for all item mentioned in scope of work on aggregate basis excluding taxes.

iv. COVERING LETTER FOR SUBMISSION OF PROPOSALS

To:

Project Director (STEM)

Pakistan Science Foundation

Islamabad.

Dear Sir,

We, the undersigned, offer to provide the services of our company/firm to Pakistan Science Foundation for "**STEM Teachers Training Activities Materials**" as per details in the attached in accordance with your RFP documents.

Yours sincerely,

Authorized Signature [*In full and initials*]:
Name and Title of Signatory:
Name of Firm:
Address:
Date:

v. Mandatory documents
(To be attached with the Proposal)

(Please attach and submit copy of this page with the Proposal after duly completing the "Response" Column along-with all the required documents)

#	Particulars	Remarks	Response Yes/No
1.	Covering Letter	Mandatory	
2.	Having nationwide presence/offices (with office in Islamabad/Rwp, mandatory) with complete addresses & active landline and fax numbers	Mandatory	
3.	Complete Profile / Introduction of bidder's company/firm (including the name of Chief Executive, Partners, Director, Professionals)	Mandatory	
4.	Copy of CNIC of CEO/Authorized person and Proof of Ownership/ CEO	Mandatory	
5.	Copy of Certificate of Incorporation from SECP, PEC or Registration from Registrar of Firms or undertaking of establishment in case of sole proprietor /partnership deed	Mandatory	
6.	Proof of the Age of the Firm (minimum 3 years)	Mandatory	
7.	Proof of having names in ATL of Income Tax (IT) & General Sales Tax (GST)	Mandatory	
8.	Bank Account Statement (for last two years (i.e., 2021-23) with minimum annual transaction of PKR 10 million).	Mandatory	
9.	Affidavit declaring that the Bidder is not blacklisted by any Government department/agency and no inquiry is ongoing against the bidder in NAB (on Stamp paper worth Rs.50)	Mandatory	
10.	List of completed and ongoing projects. Copies of Work orders/Job Completion certificate.	Mandatory	
11.	Detail of all staff members	Mandatory	

I / we hereby confirm that required documents are provided with the Proposal and information contained in this proposal is correct and true.

Company's Stamp **Signature with date**

vi **Format for Brief Introduction of the Bidder**

#	Particulars	Response
1	Name of the Bidder/Firm	
2	Date of Establishment -	
4	Owner / CEO /Director Name	
5	NTN No.	
6	Mailing Address:	
7	Contact (Landline & Cell NO.)	
8	Fax No(s).	
9	Email Address	
10	GST No.	
11	Bank Name & Account No along with title of Account.	
3	Corporate Status	
12	Attachments :	Attach list of all documents attached with the proposals
13.	Any other relevant documents	Please attach

Company's Stamp **Signature with date**

vii. Scope of Work "STEM Teachers Training Activities Materials"

The firm should prepare a work plan for the following assignment and submit it with the proposal, otherwise, the proposal is liable to be rejected.

#	Particulars	Qty/Remarks			
1	Quality of STEM Activity materials.	Best quality with long term durability.			
2	Number of STEM Activity Materials	**Subject**	**No. of Activities / Experiments (Grade 9th-12th)**	**No. of sets required for Two Sessions (5+5)**	**Total No. of sets of material for Session I&II**
		Physics	25	10	250
		Chemistry	25	10	250
		Biology	25	10	250
		Mathematics	25	10	250
		Computer Science	25	10	250
		Electronics/Arduino/DIY	25	10	250
		Total	**150**		**1500**
3	Sessions	Two training sessions containing 100-Teachers each.			
4	Packaging of STEM activity materials	Each experiment or activity should be packed separately in portable and durable materials, with a corresponding list of the specific materials included. (Zip lock or card paper box)			
5	Timeline for provision of material	At least one week prior to the commencement of the training session.			

Company's Stamp **Signature with date**

viii. Financial Proposal (Separate Envelop/File)

Bidders are invited to submit their financial proposal for the specified materials required for 200-Teachers Training, ensuring compliance with all codal formalities and regulations of PPRA/EPADS rules.

Computer Science Experiments Material

Sr. #	MODULES	Materials	Quantity Required	Rate per unit (Excl. Sales Tax) Rs	Sales Tax Rate Rs	Rate per unit (Incl. Sales Tax) Rs.	Total Value
1	**Home Automation System using Bluetooth**	• Arduino Uno • Bluetooth Module • Relay Module • Wires • Bulb App: https://drive.google.com/file/d/1WBwgVSu3P_bCXRcet4jRck-j3rNE6FOv/view	10				
2	**Voice Controlled LED's**	• 1 x Arduino Uno Board • 1 x USB cable • 1 x Bread Board • 1 x Bluetooth • 3 x LED (Red, Green, Blue) • 4 x Jumper wire (Male to Male) • 4 x Jumper wire (Male to Female)	10				
3	**Controlling Multiples devices (LED) using IOT**	• ESP8266 boards • LED • Relay Module • Breadboard • Wires	10				
4	**Water Level Indicator with Arduino**	• Arduino Uno Based • https://github.com/passion-tech/Hello-tech/blob/master/Water_Level_Sensor_with_LED.ino • Breadboard • Jumper Wires	10				

		• LED • Resistor • Woter Level Sensor					
5	**IoT-based Anti-theft alarm**	• IOT based • Node Mcu • Bulb and Holders • PIR Sensor • Relay • Transistor BC 547 • Diode 1N4007 • Node Mcu • Bulb and Holders • PIR Sneosr • Relay • Transistor BC 547 • Diode 1N4007	10				
6	**Line follower robot**	• Arduino Uno • Motor Driver Shield • Wheels (4x) • TT Gear Motor • Infrared Sensor • 18650 Li-on Battery and holders • Acrylic Sheet • DC Power Switch • Jumpers wires	10				
7	**AI-based Smart Gate**	• Arduino Board • Ultrasonic Distance Sensor • Motor Driver Module • DC or Servo Motor • Gate (or prototype gate) • Power Supply	10				
8	**Indicating distance between two objects using LED's**	• Arduino UNO • Ultrasonic sensor HC-SR04 • Jumper wires • LEDs	10				

9	**Make Your own Digital stop watch**	• Alphanum LCD, 16 x 2 • Arduino UNO • Slide Switch • button • Jumper Wire • Breadboard	10				
10	**Building a Digital Clock with Arduino and RTC Module**	• Arduino Uno • Jumper wire • LCD 16x2 with I2C Module • RTC Module • Three Resistors (~330 Olms) • Breadboard •https://core-electronics.com.au/guides/accurate-clock-arduino-uno/ • Three Push Button	10				
11	**ATM Machine Working Model**	• Acrylic Sheet • Gear System • Ice-cream Stick • Glue Gun • DC motor • syringe • Cardboard • Bottle Cane • Resistor • LEDs • Jumper Wires	10				
12	**Hand gesture control wheelchair for disabled people**	• https://projecthub.arduino.cc/afsh_ad/hand-gesture-control-wheelchair-for-disabled-people-6a299f • nRF24 Module (Generic) • DC Motor, 12 V • Jumper wires (generic) • Arduino Nano R3 • Dual H-Bridge motor drivers L298	10				
13		• Ultrasonic Sensor - HC-SR04 (Generic)	10				

	Smart Glasses for Blind Prototype	• Arduino Nano • Jumper wires (generic) • https://projecthub.arduino.cc/snehiludrhj/smart-glasses-for-blind-prototype-3eb649					
14	**Arduino Speed Object Detector**	• Male/Female Jumper Wires • IR proximity sensor • Arduino Nano • USB-A to Mini-USB Cable • RGB Diffused Common Cathode • https://projecthub.arduino.cc/yashastronomy/arduino-speed-detector-55410d	10				
15	**Make a Siren Using Arduino**	• Arduino UNO • Some Jumper wires • 10 LEDs with 220ohm resistors • 1 Passive buzzer/speaker with a resistor value 330-1Kohm • 1 push button and 10K resistor	10				
16	**Train accident Prevention project**	• Arduino Uno • 7.4v Battery or Cable • Ultrasonic sensor • Sun board sheet • 4x wheels • 6x Led lights • 6x Buzzer	10				
17	**Arduino Calculator**	• Jumper wires (generic) • 9V battery (generic) • Breadboard (generic) • 4x4 Keypad • 16x2 Character Display • Arduino UNO	10				
	Total		**170**				

Electronics Experiments Material

Sr. #	MODULES	Materials	Quantity Required	Rate per unit (Excl. Sales Tax) Rs	Sales Tax Rate Rs	Rate per unit (Incl. Sales Tax) Rs.	Total Value
1	**Up-down Counter**	1. CD40110B Dual-Clocked Up/Down Counter IC (2) 2. Resistors: 10KΩ (3), 47KΩ 3. 4007 Diode (1) 4. Capacitors: 33µF (1), 103 (2) 5. Push Buttons (3) 6. Batteries (as required) 7. VEROBOARD/ PCB	10				
2	**Logic Gates**	1. Jumper wire 2. LED MatLogic Gate ICs 3. Arduino 4. Breadboard 5. Push Buttons and Switches 6. 7-Segment Displays 7. Transistors 8. Potentiometers 9. Capacitors and Diodes 10. DC power supply Adapter 11. VEROBOARD/PCB	10				
3	**Scrolling Text**	1. Jumper wire 2. 32×8 RGB LED Matrix x 3. Arduino 4. Breadboard 5. VEROBOARD 6. DC power supply Adapter	10				
4	**Lucky Circle**	1. 00K Resistor (1) 2. 4017 Decade Counter/Divider IC 3. 1M Resistor (1) 4. 4069 IC (1) 5. 10K Resistor (3) 6. LEDs (10) 7. 270K Resistor (1) 8. Push Button (PUSH BATON) (1) 9. 2M2 Resistor (1) 10. 9V Battery Clip (1) 11. 4001 IC (1) 12. 4148 Diode (1) 13. 103 Capacitor (1) 14. 1µF Capacitor (1)	10				

		15. 220µF Capacitor (1) 16. C945 Transistor (2)					
5	**Traffic light**	1. 10k ohm Resistor 2. Diode 1N4007 3. Diode 1N4148 4. Capacitor 22uF, 16V 5. Capacitor 4.7uF, 25V 6. Variable Resistor (VR) 200k ohms 7. 5mm LEDs 8. Transistor C945 9. Timer IC NE555 10. Decade Counter IC CD4017 11. Printed Circuit Board (PCB)	10				
6	**Fire Alarm**	1. 1K Resistor (x3) 2. 15K Resistor 3. 4.7K Resistor 4. 10K Resistor (x2) 5. 150K Resistor 6. 100K Variable Resistor (VR) 7. 1N4007 Diode 8. LED (x2) 9. C945 Transistor 10. 100µF Capacitor 11. 741 Operational Amplifier IC 12. 100K NTC Thermistor	10				
7	**Smart glasses for Blind**	1. HC-SR04 - Ultrasonic Sensor X 3 2. Buzzer 3. DFRobot DF Player mini-X 1 4. Arduino UNO X 1 5. 3.5mm Audio jack X 1 6. Vibration motors X 3 7. USB to Serial Converter like FTDI 8. Slide Switch X 1 9. 5V DCBattery 10. Glasses	10				
8	**Chair Swing**	1. DC gear motor 2. Plastic star (roof structure) 3. Five plastic toy chairs 4. 9V battery 5. Common pins 6. On/off button	10				

9	**Lock System**	1. Resistors: 100KΩ (6), 10KΩ (1), 1KΩ (1) 2. Diodes: 4007 (2), 4148 (9) 3. Capacitor: 33µF (1) 4. Transistor: C945 (1) 5. IC: 4017 Decade Counter (1) 6. Relay: 12V (1) 7. LED (1) 8. Push Buttons (9)	10				
10	**Traffic Light using ICS**	1. Resistor 2. Capacitor 3. Diode 4. Variable Resistor 5. Transistor 6. VEROBOARD 7. IC 8. leds	10				
11	**Rain Alarm**	1. Resistors: 1K (x2), 1K5 (x2), 22K 2. Diodes: 4007 3. Capacitor: 47µF 4. Transistors: C945 (x3) 5. Variable Resistor (VR): 22K 6. Light Emitting Diode (LED) 7. Buzzer	10				
12	**Water Level**	1. Resistors: 10K (4x), 270K (4x), 100R (4x) 2. Diodes: 1N4007 (1x) 3. Capacitors: 33uF (1x) 4. Transistors: C945 (4x) 5. Integrated Circuit (IC): CD4011 (1x) 6. Light Emitting Diodes (LEDs): 16x	10				
13	**LED Distance**	1. ULTRASONIC SENSOR 2. DC Power Supply Adapter 3. Arduino NANO 4. Led 5. TRANSISTOR 6. jumper wire 7. Breadboards 8. VEROBOARD	10				

		9. RESISTOR					
14	**Series & Parallel**	1. Two AA batteries 2. Insulated wire 3. Two bulbs 4. Two bulb holders 5. Two battery holders	10				
15	**Electronic Toss**	1. 100K Resistor (1) 2. 4017 Decade Counter/Divider IC 3. 1M Resistor (1) 4. 4069 IC (1) 5. 10K Resistor (3) 6. LEDs (10) 7. 270K Resistor (1) 8. Push Button (PUSH BATON) (1) 9. 2M2 Resistor (1) 10. 9V Battery Clip (1) 11. 4001 IC (1) 12. 4148 Diode (1) 13. 103 Capacitor (1) 14. 1µF Capacitor (1) 15. 220µF Capacitor (1) 16. C945 Transistor (2)	10				
16	**Sound Operated Switch**	1. 3.3K Resistor (3) 2. 473 Resistor (2) 3. 2.2N Resistor (4) 4. 102 Resistor (2) 5. 1K Resistor (3) 6. 100µF Capacitor (1) 7. 22K Resistor (2) 8. 4148 Diode (3) 9. 10K Resistor (2) 10. 270K Resistor (2) 11. 4007 Diode (2) 12. C945 Transistor (5) 13. 15K Resistor (1) 14. 1K Resistor (1) 15. 200K Variable Resistor (VR) (1) 16. Condenser Microphone (1) 17. 12V Relay (1) 18. LED (1)	10				
17	**Metal Detector**	**Resistors:** 1. 3.3k ohms (3K3) 2. 47k ohms (47K) 3. 22k ohms (22K) x 4 4. 150k ohms (150K) x 2 5. 5k ohms (5KG) x 2	10				

		6. 100 ohms (100R) 7. 33k ohms (33K) 8. 1.5k ohms (1K5) 9. 10k ohms (10K) 10. 33 ohms (333) **Capacitors:** 1. 104 (0.1µF) x 2 2. 103 (0.01µF) x 4 3. 474 4. 273 5. 33µF **Diode:** 1N4146 **Transistors:** C945 BC547 x 2					
18	**Touch Switch**	1. 1k ohms Resistor 2. 10k ohms Resistor 3. 82k ohms Resistor 4. 1M ohms Resistor 5. 3.9M ohms Resistors 6. N4007 Diode 7. N4148 Diode 8. 33uF 25V Capacitor 9. 103C Capacitor 10. 224C Capacitors 11. C945 Transistor 12. CD4013 Integrated Circuit (IC) 13. Relay	10				
19	**Quiz Project**	1. Resistors: Four 470 ohms and eight 10k ohms 2. Capacitors: Four 0.1uF and one 1uF (radial) 3. Diodes: Four 1N4148 4. Battery clip for a 9V PP3 battery 5. Bleeper suitable for 3 to 6V 6. Stripboard 7. Four 8-pin DIL sockets for ICs 8. On/off switch 9. Push switches 10. LEDs 11. 2-core cable 12. Four 555 timer ICs (Integrated Circuits)	10				
20	**Trash Bot**	1. Trash bin with a lid 2. Arduino NANO	10				

		3. jumper wire 4. Ultrasonic sensor (HC-SR04) 5. Servo motor 6. Breadboards 7. VEROBOARD 8. DC Power Supply Adapter					
21	**Snake Game**	1. Speaker: 0.25W, 8 ohms 2. Resistor 220 ohm 3. Arduino 4. VEROBOARD 5. 8X8 LED display 6. TM1637 4-digit display 7. Push Button 8. DC power supply Adapter	10				
22	**Tic-Tac-Toe Game**	1. Jumper wire 2. Arduino 3. LED Matrix or Display 4. Breadboard 5. Buttons or Keypad 6. Resistors 7. VEROBOARD 8. DC power supply Adapter	10				
23	**ATM Machine**	1. Jumper wire 2. Arduino 3. servo mortor 4. Breadboard 5. LCD 6. Keyboard 7. VEROBOARD	10				
24	**Melody Bell**	1. Resistors: 4.7K (1x), 150R (1x), 15K (1x) 2. Capacitors: 47µF (2x) 3. Transistors: C945 (1x), C1383 (1x) 4. Integrated Circuit (IC): UM66 (1x)	10				
25	**Code Lock**	1. Resistors: 100KΩ (6), 10KΩ (1), 1KΩ (1) 2. Diodes: 4007 (2), 4148 (9) 3. Capacitor: 33µF (1) 4. Transistor: C945 (1) 5. IC: 4017 Decade Counter (1) 6. Relay: 12V (1) 7. LED (1)	10				

		8. Push Buttons (9)					
	Total		**250**				

Biologby Experiments Material

Sr. #	MODULES	Materials	Quantity Required	Rate per unit (Excl. Sales Tax) Rs	Sales Tax Rate Rs	Rate per unit (Incl. Sales Tax) Rs.	Total Value
1	**OSMOSIS**	• 1 L Distilled water • Measuring cylinder 1000ml • Several potatoes • Apple corer • Sucrose/Glucose • Scale with gram measurements, • 6 Boiling tubes/beakers 100ml • 3 Spoons, Ruler, • Erasable white board, Pen/Pencil, Timer • Paper towels, 6 Graph paper, 3 Wax pencil • Potato peelers	10				
2	**RATE OF PHOTOSYNTHESIS**	• Aquatic plant • Light source (lamp) • $NaHCO_3$ 100g • Water bath • Syringe • Meter ruler • Medical Thermometer • Beaker • Boiling tube • Stopper • Pipe, rubber tube • Stopwatch • Distilled water • Potometer	10				

3	**SCIENTIFIC METHOD**	• Changing of the leaves • 3 green leaves from the same tree • Rubbing alcohol • 1 glass jar • Plastic wrap • Paper Strip from a coffee filter • Small bowl with hot water in it • Sprouting Seeds • Sponge • Shallow dish • Seeds • Magnifying dish • Blossoming Beans • 1 pinto bean • 1 Ziploc bag • 1 paper towel • Spray bottle for holding water	10				
4	**TRANSPORT IN PLANTS**	Potometer Lamp Ruler, Plant shoot Scalpel, Beaker 100 ml Capillary tube Stopwatch • Vaseline	10				
5	**MITOSIS AND MEIOSIS**	• good quality plastic • acrylic plates for representing cell and different structures.	10				
6	**DEFORESTATION**	• Acrylic sheet for making platform of robot. • Arduino based project.	10				
7		• Acrylic sheet.	10				

	NUTRITION IN MAN	• Metallic ruler for percentage representation. • Plastic made shapes of different food items					
8	**MICROSCOPY AND STRUCTURE OF PLANT AND ANIMAL CELL**	Forceps Scalpel Coverslip Slides Safety goggles lab coat microscope toothpicks iodine stain onion Marker pen Sterile cotton swab Methylene Blue Paper towels The kit shall also contain well prepared specimens of plant and animal cell so that students can compare their own prepared slides with the specimens.	10				
9	**TRANSPORTATION OF FOOD AND WATER**	Plant shoot with and without leaves 3 Beakers 100ml 3 Graduated cylinder 100ml 2L Water 6 Teaspoons Food coloring (red, blue, and green), Timer Sharp knife, Microscope 50 Microscope slide, 50 Cover slips Pipette or water dropper Tweezers	10				
10	**BREATHING MOVEMENT**	• 2-liter plastic bottle with cap	10				

		• 2 plastic drinking straws • Two 9-inch balloons • 1 larger balloon/stretchable plastic sheet • 2 rubber bands					
11	**WORKING OF BICEPS AND TRICEPS TO MOVE THE ARM**	6 rubber bands (a few different sizes) thin rope, 2.5 m string, .5 m scissors paper, 1 sheet springs • one 20-Newton spring scale • ruler 12-inch	10				
12	**WRISTWATCH DESIGN FOR VISUALLY IMPAIRED**	• Guided Research, one per student • Engineering Design Project Packet, one per student • Wristwatch Project Description, one per student • Engineering Design Test, one per student • scissors • ruler, one per student • pencil, one per student • To share with the entire class: • colored pencils or markers • graph paper • drawing paper (enough for the prototype and the final project)	10				

		• masking tape (enough for the prototype and the final project) • clear tape (enough for the prototype and the final project) • hot glue gun(s) and glue (enough for the prototype and the final project) • assorted cardboard, foam-core board, matting board and cardstock (enough for the prototype and the final project) • assorted lengths of string, ribbon, etc. (enough for the prototype and the final project) • box cutters • tin snips or heavy-duty scissors					
13	**GERMINATION**	12 Petri dishes Viable Seeds (6 different types) 1 roll of Cotton wool/ 1L Sterile water 0.5 L Oil Arduino Clinostat based Microgravity project for plants.	10				
14	**DNA EXTRACTION**	• 1-3 strawberries. • 10 ml DNA Extraction Buffer • About 20 ml ice cold 91% or 100% isopropyl alcohol • Large Ziplock bags • 1 test tube • 1 beaker 100 ml • 1 funnel lined with a moistened paper towel/filter paper	10				

		• 1 coffee stirrer or transfer pipet • DNA Extraction Buffer • 100 ml shampoo • 15 grams sodium chloride • Water up to 1 liter					
15	**YEAST RESPIRATION**	1 large test tubes, about 15 cm long and 20 mm in diameter 1 small test tube, about 10 cm long and 8 mm in diameter squares cut from plastic wrap, about 8 cm on a side 12 rubber or cork stoppers, size 2 1 test tube racks to hold large test tubes 12 dropping pipettes five 300-ml beakers 1-liter flask 1-liter graduated cylinder 1 lab thermometer 1 kg (package) dry baking yeast 12-ounce bottle molasses (unsulphured) • Graph paper	10				
16	**GASEOUS EXCHANGE DURING VENTILATION OF LUNGS**	2 boiling tubes/conical flasks 2 glass and 2 plastic delivery tubes rubber bungs each with two holes 1 stop watch short lengths of rubber tubing antiseptic solution 500 ml	10				

		hydrogen carbonate indicator 500ml					
17	**ZOMBIE GOT MY LEG**	1 package of cardboard interlocking packing pieces, such as the 1 cu ft package 1 moving glass divider kit (cardboard interlocking divider pieces), ~4 pieces of PVC pipe, 6-in and 4-in lengths ~20 wooden dowel rods; ½ in diameter and ~16 in long ~7 wooden flat sticks; ¼ in thick x 2 to 4 in wide and ~16 in long ~10 ft vinyl tubing; ½ in x 3/8 in size	10				
18	**FACTORS AFFECTING THE RATE OF ENZYMATIC REACTION**	• Test tubes, at least 1.5 cm ID and 10 cm long (6) • 1 Test tube rack • Graduated Pipettes, 3-ml (3) • Access to sink • Dishwashing liquid (detergent) (1/2 cup) • 3% hydrogen peroxide • Dried yeast (1 package) • Cups (5) • 6 Measuring spoons (teaspoon and tablespoon) • Spoons or spatula for mixing • Metric ruler • Timer • Calculator • Graph paper • Paper	10				

		• Pen • Paper towels					
19	**INVESTIGATE ALIEN GENETICS**	Printout of Physical Traits Images Printout of Sibling Images Printout of the Alien Genotype and Phenotype Table Construction paper, different colors (orange and green must be included) Scissors Tape Glue Markers, crayons, and coloring pens Pencils Two coins	10				
20	**TECHNIQUES USED IN CELL BIOLOGY**	Microscope with light options: black light, base white light, or both 4 slides 4 slide cover slips 4 onion membrane samples scalpel tweezers 1 Onion Cell Lab Sheet 1 graph paper 2 sets of personal protection equipment 2 pairs of rubber gloves 6 - 50 mL beakers 6 pipettes 2 fl. oz iodine solution (laboratory grade) 1 tbsp turmeric 20 mL isopropyl alcohol 2 fl. oz tonic water 2 fl. oz energy drink 2 fl. oz soft drink	10				

		box of food coloring samples (0.3 fl. oz; box of 4 colors) 10 fluorescent markers (all same color) 2 pairs of rubber gloves for the teacher pliers (for teacher to remove fluorescent marker ink pad) kitchen cutting knife (optional; for teacher only) tablespoon box of tissues • 3-5 black lights					
21	**GROWTH RESPONCES IN PLANTS**	6 different types of plant seeds A growing plant Plastic zip-lock bags (3) Permanent pen (1) or a pen and tape 6 Paper towels Radish seeds (15) Strong tape • Large cardboard box (1)	10				
22	**DIGESTIVE SYSTEM OF A MAN**	scissors white glue tape (cellophane, masking, etc.) pens and pencils paper sheets 10 rulers assorted building materials such as: • balsa wood • construction paper • toothpicks • popsicle sticks • white paper • string	10				

		• aluminum foil • paper clips • Styrofoam • foam core • film canisters, etc. markers and crayons • hot glue gun					
23	**DISORDERS OF THE IMMUNE SYSTEM**	Bowls (8) M&M's candies (24 of each color: red, green, yellow, blue) Six-sided dice (6) • Pencil or pen • Clear tape	10				
24	**RESPIRATORY DISORDERS**	two-liter plastic bottle with cap, 2 plastic drinking straws or 6 inches (15 cm) of tubing (clear flexible tubing works well, 0.5-1.0 cm in diameter 3 balloons (1 large enough to stretch over bottom of two-liter bottle; 2 smaller ones, representing lungs) 2 rubber bands 2-inch (5-cm) cube of soft modeling clay scissors drill 1 model lung A variety of materials from which students may select to make a face mask filter, such as white paper, cotton balls, coffee filters, cloth, felt, gauze, foam, cotton batting, string, rubber bands, tape Scissors spray bottle of water	10				

		timing device					
25	**HUMAN IMPACTS ON ENVIRONMENT**	Foam core board or heavy cardboard (for creating two model buildings), ~15 x 20-inch [38 x 51-cm] sheet (which is half of the 30 x 40-in [~76 x 102-cm] size foam core board sheets 1-2 pieces of black tar paper, ~ 6 x 6-inch [15 x 15-cm] or use black sandpaper, or black construction paper to represent the black tar surface typically found on city building roofs 1-2 pieces of sod (turf) and/or other sod or moss-like plants, ~ 6 x 6-inch [15 x 15-cm] piece 1 piece of plastic sheeting (for roof deck insulation and waterproofing layer), 30 x 30-cm duct tape and hot glue gun X-ACTO knife, utility knife and scissors 2 thermometers (at least one long thermometer so you can access the interior of the model structures) 1 heat lamp 1 electric fan timer or stop watch 10 paper sheets pencils 4 sheets of graph paper • soil	10				

		Two foam core board (or heavy cardboard), ~ Two black tar paper Two pre-cut sod pieces (15 x 15cm), ~ plastic wrap for more waterproofing membrane material duct tape hot glue gun sticks					
	Total		**250**				

Chemistry Experiments Material

Sr. #	MODULES	Materials	Quantity Required	Rate per unit (Excl. Sales Tax) Rs	Sales Tax Rate Rs	Rate per unit (Incl. Sales Tax) Rs.	Total Value
1	**Electro etching**	1. Safety Wear 2. Beaker 100 Ml 1 3. DC power (4 regular AA battery cells) 1 4. Electrode 1 5. Single Hole Electric Discharge Machine with Copper Tube Electrode Drill Bit 6. Sodium Chloride 500mg 7. Sand Paper 1 8. Steel plate for electro etching 1 9. Stickers pasting on the electrode 1 10. Cotton small roll 11. Crocodile Clamps for connection securing 4	**10**				
2	**Boyles Law**	1. Syringe 60mL 2 2. Fg Balloons 3. Water bottle 4. Food Color	**10**				
3	**Atomic Model**	Atomic Model 3D	**10**				

4	**Periodic Table**	1. Periodic Table with Velcaro 2. Or a Periodic table with acrylic sockets and small boxes	**10**				
5	**Magnetic Separator**	1. Hollow plastic barrels open at two ends (two) 2. Cardboard 4*4ft 3. Strong magnets (Four) 4. Chart Paper 10 5. Wooden Sticks 6. Glue gun 1 7. Kebab Sticks 1 packets 8. Scissors 1 pair	**10**				
6	**HYDROCARBONS**	1.Ball and stick model molecule with the molecular modeling **Old Nobby, or HGS Polyhedron**	**10**				
7	**HYDROCARBONS IN OUR DAILY LIVES**	1. Tooth pick 2. Clay dough	**10**				
8	**Magical liquid**	1 2. Dropper 3. Cork (bottle cap) 4. Water 5. Sodium hydroxide 500mg 6. Glucose 500mg 7. Methylene blue 500mL 8. Measuring Cylinder 25ml 9. Beakers 250ml 10. Volumetric flask 250ml	**10**				
9	**Electrochemical cell**	1. safety goggles (one pair per student) 2. gloves (one pair per student)	**10**				

		3. 2 beakers (500 ml) 1 4. graduated cylinder (250 ml) 1 5. Voltmeter 1 6. copper sulfate (CuSO4) solution (1.0M, 250 mL) 7. zinc sulfate (ZnSO4) solution (1.0M, 250 mL) 8. 2-4 pieces of electrical wiring each with alligator clips 9. Copper electrode 2 10. Zinc electrode 2 11. sodium chloride (NaCl) solution (500 mg) 12. pipette (plastic or glass) 2 13. 20-cm filter paper strips OR filter paper folded to ~1 cm thick and long enough to touch the liquids in each 250 mL beaker 14. LED-emitting light 4					
10	**Solar Cell**	1. mini solar PV panel 2. piece of foam core board, on which to tape the solar panel 3. 2 small alligator clamps 4. a single light, such as a small Christmas tree light 5. a voltmeter 6. graph paper and pencils 7. measuring ruler	**10**				

		8. ¼-inch-thick foam core board, pre-cut into sets of wall and roof pieces that form variously-sized structures (different for each team), 9. cardboard, for plots of land; suggested size: ~24 x 24 in (~61 x 61 cm), 10. acrylic paint and paint brushes, 11. duct tape 12. scissors 13. light, small motor or buzzer 14. Xacto™ knife (and blades) 15. hot glue gun and glue sticks					
11	**Green house**	1. 6 acrylic squares, approximately 10 to 12 inches (25 to 30-cm) per side 2. hot glue gun and glue sticks 1 3. soil and plant 4. thermometer digital 2 5. clear, wide strapping tape 1 6. saws, to cut acrylic or Plexiglas 1	**10**				
12	**Galvanization/ Corrosion Resistance**	1. . Safety Wear 2. Metal Object to Be Plated (Must be Steel) 3. A Power Supply (3v-6v) 4. Zinc Sulfate 5. Water 6. A Beaker (Glass or Plastic Object Can Be Used Instead)	**10**				

		7. Zinc Metal (Can Be Found Inside Zn-C Batteries) 8. Sand Paper (120) 9. A Tissue Paper 10. Wires					
13	**Water Filtration unit**	1. Filtration Assembly 2. activated charcoal 3. gravel, 4. sand (coarse and / or fine), 5. cotton balls 6. Filter papers pore size 190 7. Filter papers pore size 150 8. F 9. Measuring cup 10. Spoon 11. Stopwatch or clock with a second hand 12. Pencil and paper 13. Coffee Filter	**10**				
14	**Corrosion Prevention**	1. Test Tubes 2. Test Tube Stands 3. Oil 4. CaCl2 5. Water 6. Nails (Galvanized)	**10**				
15	**Turn Milk into Plastic**	1. Measuring cup glass (500Ml) (1) 2. Milk (enough for each group of students to have 1 cup) 3. Stovetop/ heating mentle 1 4. Thermos 1 5. White vinegar 1L 6. Work surface that is safe to get damp Aesbestos 1(2*2ft)	**10**				

		7. Styrofoam or other heat-resistant cup 6 8. White or distilled vinegar 1L 9. Paper towels 1roll 10. Spoon 2 11. food coloring, 1 packet 12. glitter, or markers 1 packet					
16	**Paper Chromatography**	1. Beaker 3 100mL 2. Ink red and blue 3. Filter paper strips/ Rectangular 4. Filter paper round 5. Plant 6. Ethanol 500Ml	**10**				
17	**Simple Distillation Assembly**	1. Flask Round bottom---- 250 ml 2. Condenser 1------- fits in the Round bottom flask 3. Iron stands with clamps 2 4. Hot plate 1 Or Burner or Spirit lamp with Spirit 1 5. Iron Bowl 1 6. Gas pipes 2 meter 7. Conical flask 1 8. Collecting duct 2 9. T- for distillation column 2 10. Thermometers 2	**10**				
18	**Invisible Inks**	1. Safety Wear 2. Beakers 6 small, 3. cotton swabs 4. pipette 2	**10**				

		5. spatula 1 6. Glass rods 2 7. index card, one packet 8. pencil, one packet 9. lemon juice 1L 10. ammonia-based glass/window cleaner 1L 11. vinegar 1L 12. baking soda 500mg 13. red cabbage juice 1L					
19	**Design a fuel cell**	1. dilute sulphuric acid, 2. small fan, 3. voltmeter, 4. ammeter, 5. several wires, 6. glass tube, 7. graphite electrode, 8. power supply.	**10**				
20	**Lead Acid Battery**	1. Lead Acid battery 2. Electric fan 3. Crocodile clamps	**10**				
21	**Organic Ink**	1. Powdered activated charcoal 500mg 2. Water 3. Glass bowl for mixing 1 4. Spatula 1 5. Droppers 5 6. Ink pens 1 7. Beakers 6 small 8. Red Cabbage 9. Beetroot 10. Spinach	**10**				
22	**DIY Water Filtration**	1. activated charcoal 2. gravel, 3. sand (coarse and / or fine), 4. cotton balls 5. Filter papers pore size 190	**10**				

		6. Filter papers pore size 150 7. Bottles 250mL 8. Scissors 1. Measuring cup 2. Spoon 3. Stopwatch or clock with a second hand 4. Pencil and paper 5. Coffee Filter					
23	**Red Cabbage Chemistry**	1. Eight small beakers 100ml 2. Acetic acid 1L 3. Lemon juice 1L 4. Milk, 5. 7-up or sprite, 6. Sodium carbonate 500mg 7. Sodium hydroxide 8. Glint glass cleaner, and 9. Red cabbage juice indicator (prepared by teacher, see below), respectively 10. 7 ph indicator strips 11. Red cabbage	**10**				
	Total		**230**				

Math Experiments Material

Sr. #	MODULES	Materials	Quantity Required	Rate per unit (Excl. Sales Tax) Rs	Sales Tax Rate Rs	Rate per unit (Incl. Sales Tax) Rs.	Total Value
1.	**How to Make a Working Model of Pythagoras Theorem / Math working Model**	1. 2 square cardboard 20cm × 20cm 2. 2 rectangular cardboard 38cm × 20cm, 30cm × 20cm 3. 3 cardboard stripes 2cm × 30cm, 2cm × 24cm, 2cm × 18cm 4. 1 OHP sheet 5. 250g rice or pulse 6. 1 nut & bolt 7. A4 size sheets (4 colours)	10				

		8. A3 size sheets (2 blue and 1 yellow) 9. black sketch pen 10. Fevicol 11. paper cutter 12. scissors 13. Glue gun					
2.	**Circle theorems**	1. Cardboard 2. Full D 3. Office Pin 4. Rubber Band 5. Chart Paper 6. Color Marker * 4 7. Scale * 1	10				
3.	**Sets and functions**	1. Cardboard 2. Color Chart 3. Scissors 4. Fevicol 5. Glue Gun 6. Syringe 7. Transparent Pipe 8. Black Sketch Pen	10				
4.	**Trigonometric functions and their graphs**	1. Color Paper (any color) 2. Card Board 3. Thermopile 4. Aluminum Wire 5. Graph Paper 6. LED Strip Light * 2 7. Color Marker 8. 9V Battery 9. Switches * 2.	10				
5.	**Innovative Method of Learning the Concept of Circle and its Theorem**	1. Card Board 2. White Chart * 2 3. String * 1 4. Office Pins * 1 Packet 5. Color Chart * 2	10				
6	**PROBABILITY**	1. Masking tape 2. Dry-erase markers 3. Plastic cups/containers 4. Assorted colored candies or marbles	10				
7.	**Working model on algebraic identity**	1. Card Board 2. Color Marker * 3 3. Color Chart * 3 White Chart * 1	10				
8.	**Sum Should be "26" Puzzle**	1. Card Board 2. Color Marker	10				

		3Color Chart					
9.	**Distance Formula**	1. Card Board 2. Graph Paper 3. Color Marker * 3 4. Color Chart * 4 5. Office Pins * 6 6. Favicol	10				
10.	**Diagonal Move @ Math Game Puzzle**	1. Card Board 2. Color Marker * 3 3. Color Chart * 3 4. Favicol	10				
11.	**Cartesian co-ordinate math working model.**	1. Card Board 2. Color Marker * 3 3. Color Chart * 2 4. White Paper 5. Favicol 6. Office Pins Multiple	10				
12.	**HCF and LCM**	1. Wooden Slab or Card Board 2. Rubber Bands 1 * Packet 3. Office Pin 4. Color Marker * 4	10				
13.	**Sum should be 34**	1. Card Board or Thermopole 2. Color Marker 3. Color Chart 4. Favicol	10				
14.	**Venn Diagram Through Activity**	1. Color Marker 2. Color Chart * 7 3. Scissor	10				
15.	**Graph type**	1. Cardboard 3*3 Feet 2. Color Markers * 06 3. Glue * 01 4. White Sheet * 05 5. Scale * 01 6. Pencil * 2 7. Highlighter * 5	10				
16.	**Number System**	1. Cardboard 4 * 4 ft 2. White Sheet * 3 3. Colored Marker * 2 4. Glue * 1 5. Colored Sheet * 3 6. Scale * 1 7. Highlighter * 2	10				
17.	**Visual Proof of (a + b)2**	1. Cardboard 2. White Sheet * 1 3. Colored Marker * 3 4. Glue * 1	10				

		5. Scale * 1					
18.	**Visual Proof of (a - b)2**	1. Cardboard 2. White Sheet * 1 3. Colored Marker * 3 4. Glue * 1 5. Scale * 1	10				
19.	**Day of any Date**	1. Cardboard 2 * 3 2. White Foam Sheet 2 * 2 3. Scale * 1 4. Glue * 1 5. Colored Markers * 2 6. Cutter * 1	10				
20	**Exterior angle property - theorem working model**	1. Card board 2. Color chart * 6 3. Scissor * 1 4. Glue * 1 5. Glue gun * 1 6. Glue Stick * 3 7. Syringe * 2 8. Transparent paper * 2 9. Pencil * 1	10				
21	**Proof of Area of Circle**	1. Card bord 2. Color marker 3. White chart	10				
22	**Complementary angles working model**	1. Card board 2. White Chart * 1 3. Color chart * 4 4. Scissors * 1 5. Glue * 1 6. Glue Gun * 1 7. Glue sticks * 4 8. Syringe * 2 9. Transparent pipe * 2ft 10. Pencil * 1 11. Protractor Geometry * 1	10				
23	**Function Type**	1. Cardboard * 4 X 4 2. White Marker * 1 3. Thermocol Sheet * 4 X 4 4. Scale * 1 5. Color Markers * 10 6. Colored Sheet * 4 7. Glue * 1 8. Thread * 1	10				
	Total		**230**				

Physics Experiments Material

Sr. #	MODULES	Materials	Quantity Required	Rate per unit (Excl. Sales Tax) Rs	Sales Tax Rate Rs	Rate per unit (Incl. Sales Tax) Rs.	Total Value
1.	**PRESSURE IN LIQUIDS / Pascal Law/**	1. Card board 3 * 4 2. Thread * 1 3. Scissor * 1 4. Glue gun * 1 5. Glue stick * 6 6. Surgical knife * 1 7. Straw * 6 8. Tape * 1 9. Syringe * 6 10. Plastic pipe * 3ft 11. Paper Holder * 12 12. BBQ sticks * 12	10				
2.	**Archimedes principle**	1. Spring Balance 2. Measure Container 3. Stone 4. Plastic Cup 5. Steel Container 6. Mug with Water	10				
3.	**Wind Power**	1. VonHaus 2000W Heat Gun 2. ArduinoNano 3. 0.96 Inch OLED Module 4. Bread Board 5. Jumper Wires	10				
4.	**DIY Bi-Metallic Strip: Exploring Thermal Expansion**	1. Aluminum Tape * 1 2. Foam * 1 3. Glue * 1 4. Copper Strip * 1 5. Matchbox * 1 6. Connecting wires * 4nos 7. Battery holder * 1 8. LED * 2 9. Scissor * 1	10				

		10. Metal rod * 1 11. Safety pin * 2					
5.	**Force and Motion**	1. Plastic Bend Straw 01 2. Rubber Band 01 3. Balloon 01 4. Tooth Pick 01	10				
6.	**Making a DIY telescope**	1. 25 MM Eyepiece 2. 50 MM Achromat Doublet Lens with 700mm Focal Length 3. 8mm Multicoated Eyepiece 4. Pvc Pipe 5. One joiner according to the Pipe diameter 6. Outside plastic pipe	10				
7.	**TOUCH SENSOR**	1. 3.7V Battery 01 2. 4V LED 01 3. Touch Sensor 4. Jumper Wire 5. Beard Board	10				
8.	**DIY Wave Machine**	1. BBQ Stick 1 pack 2. Tape 3. Jellies 1 pack	10				
9.	**Electricity Generation**	1. Cardboard 2. Scissors * 1 3. Ruler * 1 4. Pencil * 1 5. Glue* 1 6. Wire * 1 7. Tape * 1 8. DC motor * 1 9. Battery * 1 10. Battery Connector * 1 11. LED bulb * 1	10				
10.	**DIY capacitors**	1. Plastic Pipe 3 inch 2. Plastic Piece Square 4 inch 3. Copper Wire 4. Aluminum Tape	10				

		5. Color Marker					
11.	**FLUID DYNAMICS**	1. Syringes * 2 2. Ice cream stick * 6 3. Copper wire * 1 4. Aquarium hose * 1 5. BBQ stick * 1 6. Beverage straw * 1 7. Cardboard 8. Glue stick * 6 9. Glue gun * 1	10				
12.	**Homemade projector**	1. Zero PCB 2. Micro USB Female Port 3. Diode 1N4007 4. 1K Resistor 5. Red LED 6. Micro USB Male Port 7. Push Button Switch 8. Self Lock ON/OFF Switch 9. Keypad Mobile Phone 10. Silver Cake Board 11. 10W + 10 W 4V LED 12. Fresnel Lens 13. 3.7V LI-ION Battery 14. 50mm End Cap 15. 40mm PVC Pipe 16. Projector Lens	10				
13.	**OPERATING LOGIC GATES**	1. Bread Board 2. Push Switch * 2 3. Resistor * 6 4. Transistor * 6 5. LED *2 6. Contacting Wires	10				
14.	**RLC**	1. Capacitor 2. Inductor 3. Iron Core 4. Light Bulb 5. Power Supply	10				

15.	**Electronic Torque**	1. Icecream Sticks Multiple 2. Cardboard 3. DC Motor 01 4. Battery 01 5. Switch 01 6. Color Chart 04 7. Connecting Wires	10				
16.	**Sound Science**	1. Steel Wool 2. Paper 3. Test Tube 4. Small burner 5. Air Generator 6. Engine Piston for testing	10				
17.	**Electrostatic Charge**	8. Red balloon 9. Wool 10. Paper	10				
18.	**Ohm's Law**	1. Bulb holders * 5 2. Bulb * 5 3. Connecting wire * 2ft 4. Power source	10				
19.	**Gravity**	1. Card board 2. Color paper * 3 3. Scissors * 1 4. Glue stick * 3 5. Glue gun * 1 6. Round magnets * 2 7. Big ball * 1 8. Small ball * 1 9. Color marker * 3 10. Woolen thread * 1 11. Paper cup * 2	10				
20.	**Steam Engine**	1. Cylindrical Box 2. Metal Pen 3. M Seal 4. Plywood 5. Iron Nail 6. Aluminum sheet 7. 3V DC Generator(motor) 8. 1V LED Bulb	10				

		9. Kerosene Lamp					
21	**Solar Eclipse**	1. Cylindrical Box 2. Metal Pen 3. M Seal 4. Plywood 5. Iron Nail 6. Aluminum sheet 7. 3V DC Generator(motor) 8. 1V LED Bulb 9. Kerosene Lamp/Torch	10				
22.	**Solar System**	1. Card board 2. Color paper * 5 3. Paint color * 4 4. Paint Burch 5. Glue * 1 6. Glue gun * 1 7. Glue sticks * 3 8. Scissor * 1 9. 9V Batteries 10. Switches 11. LED Lights 12. Connecting wires 13. Serial LED lights 14. Waste LED bulb covers * 9	10				
23.	**Full Wave Rectifier**	1. Step down transformer * 1 2. diode * 2 3. Resistor * 1 4. LED * 1 5. Capacitor * 1 6. Power cable * 1 7. Board * 1	10				
24.	**Auto Hand Sanitizer**	1. Photodiode 2. Ir LED 3. BC-547 Transistor (2) 4. 100 Ω, 15 kΩ Resistor Adpter 5v 5. Mini Water pump with palstic Pipe	10				
	Total		**240**				

Generic Components for Teachers Training STEM Activities/Modules

Sr. No	Materials		Quantity Required	Rate per unit (Excl. Sales Tax)	Sales Tax Rate	Rate per unit (Incl. Sales Tax)	Total Value
1	Soldering Iron 40W with Stand		25				
2	Soldering Paste		25				
3	Soldering Wire 100g role.		25				
4	Mini Drill		10				
5	Multimeter		10				
6	Resistors Package(30-Resistance with 100Pcs Each) Box		10				
7	Arduino Uno SMD with Cable		10				
8	Arduino Nano with Cable		10				
9	Bread Board Jumpers Wire Role		40				
10	Jumper Wires Set Pack		100				
11	Battery 9V		100				
12	Battery Connector		50				
13	LED 3MM (500Pcs Pack)		10				
14	Blade Cutter		50				
15	Glue Stick dozen		30				
16	Glue Gun		10				
17	Thread (dozen)		2				
18	Saw		20				
19	Saw Blade		100				
20	Scale 24 inch (dozen)		2				
21	Steel Scale 12 inch		10				
22	Double Tape (dozen)		2				
23	Led Pencil		200				

24	Eraser		200				
25	Sharpener		200				
26	Color Marker Different Colors(packs)		30				
27	Color Chart		100				
28	White Chart		200				
29	Scissor Small		10				
30	Scissor Large		10				
31	Screw driver Set		10				
32	Graph Paper		10				
33	Safety Gloves (packs)		4				
34	Glue gum Stick (UHU) small		50				
35	Rubber Band (Packs)		4				
36	Push Buttons		100				
37	Buzzer		100				
38	Balloon (pack)		4				
39	Office Pin (pack)		4				
40	Paper RIM		2				
	Total		**1889**				

Summary

Sr. No	Materials		Quantity Required	Rate per unit (Excl. Sales Tax)	Sales Tax Rate	Rate per unit (Incl. Sales Tax)	Total Value
1	Material Lis of Computer science STEM Activities		170				
2	Material Lis of Electronics STEM Activities		250				
3	Material Lis of Biology STEM Activities		250				
4	Material Lis of Chemistry STEM Activities		230				
5	Material Lis of Math STEM Activities		230				

6	Material Lis of Physics STEM Activities		240				
7	Material Lis of Generic STEM Activities		1,889				
	Total		**3,259**				

Company's Stamp **Signature with date**

xi. TECHNICAL EVALUATION CRITERIA:

The bidder/firm should submit online on EPADS a copy of this page of RFP duly signed and stamped along with the Proposal, otherwise the proposal is liable to be rejected

#	**Particulars**		**Maximum Marks**	**Marks Obtained** *(for official use only)*
1.	Location of Offices with complete address & and active landline and fax numbers	Islamabad/Rwp = 7 marks Any other city = 3	15	
2.	Age of the firm (not less than 03 years)	Minimum three years of age 5 points for each year after mandatory age (maximum 15 points for 3 years or above)	15	
3.	Bank Statement for the last two years (i.e. 2021-23)	Transaction during last year is Minimum (Rs.) 7 million = 10 marks Between 7-12 million =15 marks Above 12 million = 20 marks (Max)	20	
4.	Detail of similar supplies and services undertaken (Attach work orders with proof of completion of Job/work orders.)	Marks for each supplies; Up-to 2 million =8 Up-to 3 million =10 Up-to 4 million = 12 Above 5 million = 20	50	
Total			**100**	

Note: The bidder/firm fulfilling all mandatory requirements and obtaining minimum 60 marks in the above technical evaluation will be considered as technically qualified. The financial proposal of only technically qualified firms would be opened.

Company's Stamp **Signature with date**

x. List of Major Job/work order Completed

#	Clients / Organization	Description of Project	Place / City	Overall Approx. Cost of Project	Duration	Completion Year or Ongoing

Use extra sheet in the same format (if required).

Company's Stamp **Signature with date**

xi. <u>List of Clients</u>

I / We have provided supplies/services to the following **Clients** (along with their details):

#	Category	Clients / Organization Served	Concerned Officer of Client / Organization (if available)	Contact No. / Email (if available)

Use extra sheet in the same format (if required).

Company's Stamp **Signature with date**

xii. Details of Staff

#	Name	Designation	Qualification	Years of Experience

Use extra sheet in the same format (if required).

Company's Stamp **Signature with date**

xiii. List of Offices with Contact Persons

#	Based at City	Partner / Concerned Officer	Contact Address	Contact No.

Use extra sheet in the same format (if required).

Company's Stamp **Signature with date**

xiv. TERMS & CONDITIONS

Terms & Conditions for Bidders

1. Only EPADS-registered bidders/Suppliers/Contractors and Manufacturers can apply for the tender. Bid other than EPADS will not be considered and entertained.
2. The Suppliers, Contractors and Manufacturers with nationwide supplies and contracts with own supplies facilities will be preferred (if applicable).
3. The bidders/firms shall be responsible for the complete delivery and working guarantee of each material item at the designated training center.
4. The bidder must enclose product details (item-wise) in each STEM activity kit.
5. Firm/Bidder will complete the job/work order within the stipulated time initially decided or agreed.
6. The supplies will only be deemed as "delivered" and qualify for invoice if it has been delivered to the specified address/destination without any damage/loss.
7. STEM activity/experiment material must be nontoxic, ecofriendly, and user-friendly materials without compromising on quality and international standards.
8. Detail of any arbitration/litigation (If any) of similar proceeding against Government / Autonomous / Private body showing extent and results may be enclosed.
9. The quantity of materials may be adjusted, increased, decreased or replaced as needed for the activities, without affecting the financial aspects.
10. The participants must submit valid proof for having names in Active Tax payer list of Income Tax (IT) & General Sales Tax (GST), and list of clients with contact person (regular and occasional) on PSF specified format.
11. Payment will be made in the form of a cross-cheque upon successful completion of job/work order and deduction of applicable Government Taxes.
12. The bid documents should be submitted within 15 days of publication of this advertisement via EPADS. These bids will be opened on the same day at 11:30 am.
13. PSF will not consider any proposal from the bidder, blacklisted or declared defaulted by any forum/organization. The Firm/Bidder should provide affidavit that it is not blacklisted nor it will resort to any litigation regarding the tendering/procurement procedure.
14. The financial proposal of the technically qualified firm with the lowest financial value conforming to the bidding documents and other terms and conditions prescribed in

the tender document shall be considered for placement of the Job/Work Order.

15. The bidder will start the task, on receipt of written Job/Work Order from PSF in accordance with the given terms, conditions, and specifications.
16. Incomplete proposals or those received after due date and time will not be entertained.
17. PSF reserves the right to cancel the process or reject one or all bids on the basis of technical reasons mentioned in the Tender Documents.
18. Performance Guarantee in the shape of a bank guarantee of 5% of contract/invoice value would be furnished by the successful bidder, where it is applicable.
19. The bidders/firms would submit 2% of the bid amount as earnest money in the shape of DD/PO in favor of the Project Director, STEM at the time of submission of the bids.
20. No advance payment for the arrangements shall be made.
21. **In case of any dispute, the case will be referred to the Chairman, PSF who will be sole arbitrator and his decision will be binding on both parties.**

Company's Stamp **Signature with date**

For further information and clarification, please contact:

To, Project Director (STEM)
Pakistan Science Foundation
1-Constitution Avenue, G-5/2
Islamabad.
051-9201236

xv. (LEGAL PART) ***only for successful bidder. No need to submit this part.***

SCHEDULE - F TO BID

1. (INTEGRITY PACT)

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC.

Payable by the suppliers of goods, services & works in contracts worth Rupees.10.00 Million or more

Contract No.: _____
Dated: _____
Contract Value: _____
Contract Title: _____

_____ [*Name of Supplier*] hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Pakistan (GOP) or any administrative subdivision or agency thereof or any other entity owned or controlled by GOP through any corrupt business practice.

Without limiting the generality of the foregoing, [*Name of Supplier*] ____ represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GOP, except that which has been expressly declared pursuant hereto.

____ [*Name of Supplier*] _____ certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GOP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

____ [*Name of Supplier*] _____ accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to GOP under any law, contract or other instrument, be voidable at the option of GOP.

Not with standing any rights and remedies exercised by GOP in this regard,_____ [*Name of Supplier*] _____agrees to indemnify GOP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GOP in an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by [name of Supplier] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from GOP.

Name of Employer: Name of Contractor/Supplier:

Signature: _____ Signature: _____

[Seal] [Seal]

xvii. PERFORMANCE SECURITY BOND (Bank Guarantee)

Guarantee No. _____
Executed On _____
Expiry Date _____

(Letter by the Guarantor to Pakistan Science Foundation, PSF)

Name of Guarantor (Scheduled Bank in Pakistan) with address:

_____

_____
_____

Name of Principal (Contractor) with address:

_____

_____
_____

Penal Sum of Security (express in words and figures)

_____

_____
_____

Letter of Acceptance No._____. Dated_____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bidding Documents and above said Letter of Acceptance (hereinafter called the Documents) and at the request of the said Principal we, the Guarantor above named, are held and firmly bound unto the (hereinafter called PSF) _____ in the penal sum of the amount stated above, for the payment of which sum well and truly to be made to the PSF, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has accepted the PSF's above said Letter of Acceptance for (Name of Contract)

_____

_____

_____for the_____

(Name of Project).

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the PSF, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly

perform and fulfill all the undertakings, covenants terms and conditions of the Contract and of any and all modifications of the said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 9, Remedying Defects, of Conditions of Contract are fulfilled.
Our total liability under this Guarantee is limited to the sum stated above and it is a condition of any liability attaching to us under this Guarantee that the claim for payment in writing shall be received by us within the validity period of this Guarantee, failing which we shall be discharged of our liability, if any, under this Guarantee.

We _____, (the Guarantor), waiving all objections and defenses under the Contract, do hereby irrevocably and independently guarantee to pay to the PSF without delay upon the PSF's first written demand without cavil or arguments and without requiring the PSF to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the PSF's written declaration that the Principal has refused or failed to perform the obligations under the Contract, for which payment will be effected by the Guarantor to PSF's designated Bank & Account Number.
PROVIDED ALSO THAT the PSF shall be the sole and final judge for deciding whether the Principal (Contractor) has duly performed his obligations under the Contract or has defaulted in fulfilling said obligations and the Guarantor shall pay without objection any sum or sums up to the amount stated above upon first written demand from the PSF forthwith and without any reference to the Principal or any other person.

IN WITNESS WHEREOF, the above bounded Guarantor has executed this Instrument under its seal on the date indicated above, the name and corporate seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____
Guarantor (Bank)

Witness:
1. Name _____. Signature _____

_____ _____
(Tittle & Address) Corporate Guarantor (Seal)

2. Name _____ Signature _____

_____ _____
(Tittle & Address) Corporate Guarantor (Seal)