Implementing Partner:

STEM Learning – "A Social Enterprise"

STEM

Building Brains.....Beyond Books.....

Mini Science Centre

Teacher Training Program

Science Competition (NSP)

DIY – Model Making

Concept Note

Mini Science Centre

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Proposal for Establishing Mini Science Centre in Paradeep

About: STEM Learning Pvt. Ltd:

STEM Learning was conceptualized with an aim to inculcate basic concepts of Science, Technology, Engineering, Mathematics at school level, thereby encouraging inclination of students / learners towards science and technology. Models designed by STEM help students in identifying and experiencing the actual concepts which they learn from text books making it more practical in approach

STEM believes that school education can't be only visual or audio but it is important for the children to practically feel the products and experience it. With this vision, STEM has customized 80 models based on 150+ concepts of Science and Math's for better learning and understanding of the concepts. STEM believes in adding more models for improved learning of students especially for those from less privileged section of the society.

STEM through its MSC's have benefitted over 1 Million students with 10000+ teachers in 2000 + schools across 24 states in India. These science centre's have trained more than one lakh students who otherwise would have never got chance to experience and explore science in a practical and easy way.

STEM's models are approved by ***7 SCERT***- *Maharashtra, Goa, Chhattisgarh, Delhi, Odisha, Nagaland and Jammu & Kashmir* for their alignment with the curriculum and the approvals by the SCERT's of Andhra Pradesh, Telangana and Karnataka are awaited for approval.

Mission Statement:

- To enhance students' aptitude towards science & math so that they embrace it and grow with it while relishing the learning process.

Vision Statement:

- To be recognized globally for bringing innovative learning products in School Education and contributing to the society by reaching to the less privileged students

Goal:

- Learning made accessible to all children for aptitude enhancement.

C.1: **Immediate Goal:** Reaching to Large population of under privileged Children Pan-India

C.2: **Aim:** Ensuring equal opportunities for learning and development of all under privileged Children.

2. *C.3:* **Immediate Aim:** Reaching 3000 schools in the academic year 2022-23.

2. *C.4:* **Objective:** Empowerment/Enhancement of aptitude of children.

Specific Objectives:

To ignite scientific interest in children so that:

- Question intelligently.
- Learn through discovery & Innovation.
- Connect scientific knowledge to their world
- All of these are expected to strengthen scientific temper in children, thus laying the foundation for a flourishing career in Science & Mathematics

Strategic areas of Focus:

- Providing quality teaching aids to improve teaching methods for students from lesser privileged sections of society.
- Enhancing a positive attitude, learning capacity, and skills of students.
- Providing a platform where students and teachers can volunteer for customized engagement programs/events.
- Creating partnerships and collaborating with various stakeholders to ensure sustainability of the project.

Background and Project Need:

The education system in India is undergoing a transformational process with special emphasis on Science and Math's education. Science education in India is faced by various practical challenges today. The first and the most basic problem that has persisted and resisted solution since early education, is our inability to ease the fear of difficult subjects such as science and math's and make it simple and fun so as to help retain the knowledge and strengthen the foundation of the child for future.

Science is knowledge about the material, natural world. It is knowledge produced from systematic observation, measurement, experimentation, exploration, and speculation and theorization about natural objects, their properties and their interactions. Whether the topic of forces in Physics or the solubility of substances in water from Chemistry, or germination in Biology, the science curriculum directs attention to the material world, to things and processes in it; about which it would like children to learn—to notice, name and think about things based and theories that characterize these disciplinary approaches, further more mathematics establishes the foundation for calculation is a part of everyday life

However, disciplinary approach is essential in learning BUT it is also imperative to ensure that we make the subject interesting; as, it is a challenge to large percentage of children to comprehend the formulas and equations. This not only limits the learning of students about science & Math's but also lessen the interest of children in these subjects and a fear psychosis is created in their minds for these subjects.

Our Honorable Prime Minister during the 104th Indian Science Congress on 'Science and Technology for National Development, emphasized that the government is committed to support the different streams of scientific knowledge from fundamental science to applied science with an emphasis on innovations.

Prime Minister instituted the concept of 'scientific social responsibility'. Underlining the need to inculcate the concept of 'scientific social responsibility (SSR)', akin to corporate social responsibility, PM Shri Narendra Modi ji put the impetus on corporates to actively participate in developing science and technology centers across India.

We at STEM Learning provide the Mini Science Centre – (MSC) that support and encourages the students to develop aptitude & skills. Science activities done to stimulate curiosity, provide practical opportunities to explore a concept in easy ways, develop appropriate hands-on experience in understanding science and its concepts which is sadly absent today across all our education syllabus. More so with inadequate teaching staff in rural, municipal schools which are for the underprivileged children adds to the existing challenge in the education system.

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STEM Learning MSC Locations:

STEM learning has pan India presence in 24 states of India and have proven our process of Installation, delivery- Teachers Training Program along with Monitoring & Evaluation and Maintenance of MSC.

1. Maharashtra 2. Rajasthan 3. Gujarat 4. Karnataka 5. Himachal Pradesh 6. Jammu & Kashmir 7. Goa 8. Haryana 9. Delhi 10. Tamil Nadu 11. Uttar Pradesh 12. Jharkhand 13. Chhattisgarh 14. Madhya Pradesh 15. Andhra Pradesh, 16. Odisha 17. Telangana 18.Bihar.19 Uttarkhand.20.punjab21.Odisha22.Dadra ang Nagar Haveli 23.Assam 24. Manipur

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Reforming Education

STEM Centre

STEM Centre :

- Clearing fundamentals of science concepts.

– Tinker Workshop:

- Out of the box and conceptualizing a solution for a digital world.

– Digital DIY Model Making:

- A platform that ignites the spirit of competition among peers and enhancing their creativity and innovation beyond books

– NSP :

- A platform that ignites the spirit of competition among peers, enhancing their knowledge & innovation beyond books

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Project Summary Statement:

1) Mini Science Centre

(MSC) is an educative, innovative and systemic instrument designed to revolutionize science & math's education that makes learning simpler and accessible. It is a catalytic channel that is interactive, engaging & fun way of learning technique aimed to raise awareness, grasp the information & strengthen the aptitude of children; furthermore, MSC supports the teachers in teaching - with a focus on concepts from science & math's. Mini science Centre has a range of *80 table top working models with 37 back-drops and manuals in regional language* to provide hands-on experience for learning/teaching Science and Mathematics for Class 5 through 10.

MSC will be a permanent and integral part of the school and academics right from its installation.

The models designed for MSC forms the basis for effective education and better understanding of the academic concepts and their practical applications. Principally these models are ….

- For all students from standard 5 to 10.
- Intentional and standards-based.
- Active, interesting, and relevant to students.
- Reflect current research and practices that are curriculum based.
- Age-level appropriate.
- Integrate skills from different subjects of Science and Mathematics. Incorporate staff training in science and Math's teaching.
- Based on ongoing assessment of student needs and progress.

2) MSC Project – Human Resource:

- Project Manager
- Zonal Managers
- Program Implementation Associate
- Installation associates
- Maintenance Associate
- Program Evaluation Associates (M&E)
- DIY Team
- Tinker Team

Expected outcome of the program:

i. Aptitude of students for learning science and mathematics improved by creating simple, child friendly eco system which is fun and enjoyable.
ii. Empowering teachers with easy teaching aids.
iii. Improve teaching pedagogy by use of models in conducting the science and math's class through better engagement of teachers in teaching.
iv. Increased enrolment and interest in STEM-related courses in school.
v. Continued participation in STEM programming.
vi. Increased self-confidence in tackling science & Math's classes and projects.
vii. Shift in attitude about careers in STEM.
viii. Increased test scores as compared to non-participants.
ix. Increased general knowledge of science & math's-based concepts.
x. Gains in 21st century skills, including communication, teamwork, and analytical thinking.
xi. Higher likelihood of graduation and pursuing a STEM career.

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Logical Framework Analysis

Input	Output	Outcome	Measurement indicators	Timelines (Quarterly)	Risks Vs Mitigation
School Identification	• Identifying government schools from areas of deficit	• An intervention plan will be created. • Meeting with school principal for formal MSC introduction and benefit for students	• Receiving list of schools from DEO • Visiting government schools • Well drafted intervention plan introduced to school • Receive Installation Approval letter from school	1st quarter	• Inter-state and city travel, risk of covid-19 infection • Multiple visits to schools and getting permission
Baseline survey	• A thorough knowledge about various conditions, needs and its intervention for school.	• to understand problem & need by gathering information on the status quo of the school	• Preparing baseline question tool • Visit by PIA to conduct baseline survey on student and teachers • Identify 1 room for MSC installation • Baseline report created with analysis	1st quarter	
MSC installation	• MSC installation in room of 80 models with 37 back-drops and manuals in regional language	• To provide hands-on experience for learning/teaching Science and Mathematics for Class 5 through 10. • Maximize Learning experience through practical approach • Explains 150 + concepts with depth clarity	• Install tables and 80 plugs • Transport 80 models to school • MSC models testing and function check • Inauguration of MSC with Clients, BD and PIA	1st Quarter	• Long distance travel with MSC models transport from warehouse
Teacher Training Program -TTP	• Call and TTP scheduling by PIA • Training Through PPT of MSC models • Benefits • Best usage • Maximum utilization • Models & concepts it explains in simpler way • Benefits & takeaway of MSC will be highlighted • Question – answer and queries will be resolved	• Teachers empowered with innovative teaching aids • Teaching time reduced to 50-60% • Complex concepts taught easily • Active engagement of students in class • Replace rote-based learning to practical-based approach for sustainable knowledge	• TTP will be scheduled • TTP with PPT will be conducted • Feedback & suggestion from teachers • TTP report created for documentation	1st quarter	• **Risk:** Absentees • **Mitigation:** Constant update of MSC benefit will be communicated.
MSC-Maintenance	• PIA along with MSC technical person, free	• Continuous and Maximum	• Quality check of MSC by Team technician	3rd quarter	

	maintenance drive is conducted. • Aim: Learning shouldn't stop, student can use MSC independently	utilization of MSC for sustainable use	• Repair and place if needed • Maintenance report created • MSC model utilization register maintained		
Midline Survey	Survey to understand the impact of MSC on students and teachers academic learning and teaching achievement	• By then the impact on students: - explore their talents, apply theory knowledge to practice, gain essential skills, develop analytical & critical thinking	• Prepare midline M&E questionnaire • PIA will schedule date & time for M&E • M&E conducted with teachers and students • Report of midline report created with analysis		
Refresh Teacher Training Program -RTTP	• Improve & enhancement of teacher's skills • Techers empowered with innovative teaching aids to explain concepts with each • Benefits & takeaway of MSC will be highlighted • Training to refresh best usage of MSC for maximum utilization	• Learning and using innovative teaching aids for quality teaching and better understanding of subjects • Reduces stress and completes syllabus on time • Class will be more interactive as students will take keen interest to learn science and math	• RTTP scheduled • RTTP with PPT will be conducted • Feedback & suggestion from teachers • TTP report created for documentation	3nd quarter	
MSC - Monitoring & Evaluation	• To understand student's needs and improve for Opportunities & innovative ideas for maximum learning.	• Students will be confident and empowered through new skills gained. • Reduced future academic anxiety. • Opportunities to explore one's potential Peer to peer learning and support	• Google form for M&E • Qualitative feedback through interview. • Quantitative data analysis	4th quarter	
Client Visit to MSC established school	• Coordinate and arrange visit to client's CSR funded school	• The client will witness themselves the impact created through MSC installation • Transformation in skills knowledge and self-confidence	• Annual Report • Annual PPT • Videos of impact and students' achievement – Client wise & School wise	1rd and 4th quarter	

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Some of Our MSC Models:

$(a+b)^2=a^2+2ab+b^2$

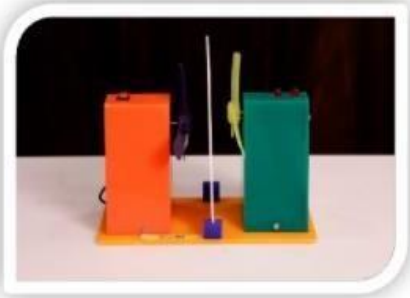
Floating Magnets

Pythagoras

Pin Screen

Conductors-and-insulators

Wheel-and-axel

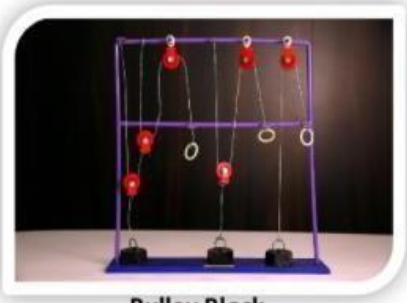


Windmill

Elliptical Carrom Board

Lever

Tangram



Pulley Block

Area of Rhombus

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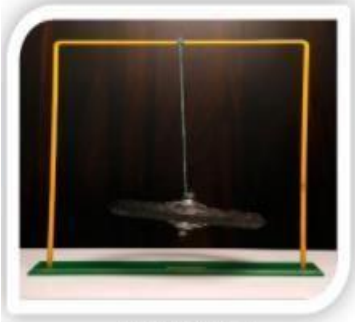
Centrifuge-Puzzle

Electric Bell

Fun with Magnets



Gyroscope

Total Internal Reflection

Law of Inertia

Mini Science Centre												
Activities	**Month 1**	**Month 2**	**Month 3**	**Month 4**	**Month 5**	**Month 6**	**Month 7**	**Month 8**	**Month 9**	**Month 10**	**Month 11**	**Month 12**
MOU												
Mini Science Centre School Identification												
Need Assessment												
Mini Science Centre Installation												
Mini Science Centre Awareness												
Program Offerings Orientation												
Fresh Teacher Training Program (FTTP) Cluster												
MSC Utilization/ Best Pratice												
MSC Maintenance												
Refresh Training Program (RTTP) Cluster												
M&E												

Program Aspect	Expected Deliverables
School Identification and Mobilization	STEM initiates the process by connecting with the District Education Officer (DEO) if it's a government recognized school (for private aided school, we don't need DEO permission]. Post letter from DEO, we approach the school authorities with a Letter of Understanding and get their acceptance in the same. The letter clarifies the ownership details of MSC, handling of models, material and electricity. We also share the expected outlay plan (Installation requirement} for MSC set up with both school and the donor partner. In the next step, school details are compiled which consists of the following: • School location and distance from the main road. • Year the school started operating. • Room availability as per out lay plan. • Student's strength in school. • Gender segregation details. • Cumulative grades of students along with number of students in class/division. • Other infrastructure/facilities available in the school: Science lab/Computer lab/Library. All the above process is documented in the report titled "School Identification report".

MSC Infrastructure arrangement	The infrastructure arrangement is optional in nature. Schools can also arrange the same on their own. If it is being by STEM Learning, then it is chargeable. Infrastructure arrangements include: • 80 table top models will be installed in the school out of which 17 models operate on electricity. • A proper room minimum of 350-400 Sq. ft. or suitable size along with 17 tables/ platform with plywood 100 Running feet (8ft x 1.5ft) - 13 pcs for Mini Science Centre should be provided in the school. • 17 electrical connections in the room should be provided in the school. • Providing the Backdrops (Language in which it is to be printed should be conveyed beforehand). • Providing the user manual and training manual (Language in which it is to be printed should be conveyed beforehand). • Logo of the partner in jpeg. and cdr. format which will be printed on Sun Board at the entrance.
Installation of MSC (80 MODELS + 80 USERS PLACARD+ 40 COLOURFUL BACKGROUNDS + 1 SAFETY PLACARD + 1 TEACHERS MANUAL)	Installation generally starts within 3 weeks from the school closure/ signing of MOU and is completed within 2 days at the school premises. The MSC classroom is painted in white colour & mounting of plywood is done along with fitting electrical supply points. The Installation team takes pictures of the room both pre & post installation and a letter is signed from the school authority (Principal) after successful installation and handing over of the materials/documents etc. All the above process is documented in the report titled “Installation Report”.

First Teachers Training Program (TTP) - (Conducted in cluster of 5 schools within a vicinity of 15-20 km)	1st Teachers training program is undertaken within 2-3 weeks from the installation. Trainer's team get in touch with the school authorities- Principal & Teachers the schedule the training date & venue. 72 hours before the TTP, reconfirmation is taken from principal and teachers. The training consists of the following: 1) Orientation of Models 2) Usage as per the concepts. 3) Mapped document of model with curriculum. 4) Establish topics and usage as per the timetable. 5) Explaining the follow up process for any queries through Phone calls and WhatsApp support group formation. 6) Updating the MSC Register, as the models are plug and play, it can be demonstrated in class for concept clarity. 7) Identify and prioritize issues to be dealt by teachers. 8) Set up goals for best practice documentation. 9) Inform about Monitoring &Evaluation visit and process. The documents supporting this activity are: a. Call sheet b. WhatsApp group snapshot. c. Goal set document for output. d. Teachers' attendance sheet of training. e. Pictures and Videos (if possible) All the above process is documented in the report titled "1st Teachers Training Report".

Refresher Teachers Training Program (TTP) – Conducted Individually for each school.	It is generally conducted after 4 months of 1st TTP. Trainer's team get in touch with the school authorities- Principal & Teachers the schedule the training date & venue. 72 hours before the TTP, reconfirmation is taken from principal and teachers. The training consists of the following: • Engagement of teachers about usage of models. • Identifying models with frequent usage. • Frequency of models being taken to class for explanation of concepts. • Asking the teachers regarding any issues faced by them in the usage of the models and solving it accordingly. All the above process is documented in the report titled "Refreshers Teachers Training Report".
Utilization Check of MSC	After completion of both the Teachers' Training Program, WhatsApp group is created between teachers and our own trainers to periodically check the utilization of the models. Footages of teachers using the models is to be posted regularly on the WhatsApp broadcast group. • Random visits to school to check usability of the models. • Every fortnightly, check is done to gain insights about the frequency of usage of the models. • MSC registers are frequently looked upon to crosscheck the claims made by the teachers about the usage of MSC.

1st Monitoring and Evaluation (Baseline Survey)	By this, a thorough knowledge about various conditions, needs and intervention for school is checked. It is generally conducted within 4- 5 weeks from the 1st TTP. Baseline questionnaires is prepared for students based on their curriculum taught as per their standard. Our team i.e. Project Implementation Associate visits and conducts the baseline survey on teachers and students both. The M&E consists of collecting data on: • No. of students per Class/division. • Foundational skills for progressive improvement. • Gender segregation. The Principal and teachers questionnaire will be qualitative while for the students, it will be quantitative and qualitative with Focused Group Discussion (FGD). The students quantitative tools will include: 1) Fill in the blanks. 2) Match the columns. 3) Questions and 3 options. 4) Pictorial identifications of models. The documents supporting this activity is: 1) Call sheet. 2) WhatsApp group snap shot. 3) Questionnaires 4) Notes of FDG. 5) Pictures and Videos (if possible). 6) Raw data in excel. 7) M&E report.

Maintenance (Free maintenance is for 1st year only, from 2nd year onwards, it will be charged).	The maintenance team visits the school after the 1st M&E visit. (2-3 weeks after 1st M&E visit). The maintenance will include: • Repairing and Replacement as and where required. • Re-clean the premises. The documents supporting this activity is: • Pictures of repaired model • Pictures of replaced model • Signed report of maintenance from Principal/Teacher All this will be documented in a report titled as "Maintenance report".
2nd Monitoring & Evaluation Visit	Generally conducted 6-8 weeks after the maintenance visit. Qualitative: FGD and IDI (In-depth interview) lead questions will be framed for students on actual usage in class and MSC. The same process is followed for 2nd M&E as explained in the 1st M&E visit. The 2nd M&E will be the 1st year baseline and based on the goal set, data will be captured in the 2nd set of questionnaire, which will be developed. The report will be known as "2nd Monitoring & Evaluation Report (1st Years baseline)".

Few Important points in relation to the Monitoring and Evaluation

The Snowball technique is selected to identify output, outcome & impact of the project.

Four times in a year the data is collected by the M&E team through Focus Group Discussion & Interview Method. The data is recorded in excel sheet and is presented in tables, charts in descriptive format as per the requirement.

Outcome report (Qualitative and Quantitative report)

Baseline - Collection of data from schools with regards to beneficiaries and status of STEM temper.

Mid line (6 Months) – Qualitative and Quantitative change since baseline in schools.

End line – Annual report at end of year - Measurable outcome with regards to improvement on scientific and math temper among children.

Conclusion:

As the famous saying goes, "It is greater to work to educate a child, in the true and large sense of the world than to rule a state." The real empowerment of a country lies in the hands of the children. There cannot be any weapon bigger than education to empower country. STEM education plays an important role as it pervades every aspect of life.

Our STEM Centre, provides more practical based learning and teaching style of Science and mathematics concept. This would equip the students with better clarity on the application of difficult concepts of Science and mathematics in their syllabus. The clarity of concepts would enable the students to think critically, analyze and explore the new horizons which would eventually benefit the society. The following are the benefits of STEM Centre:

Capacity Building of Teachers: MSC enables teachers to explain all the Mathematics, Physics and Science concept in a more effective manner. It saves the teaching time by 50% which means the increase in productivity of the teachers in school.

Improves the scientific temperament of students: Instead of reading from book and listening to teachers, MSCs Plug & Play models involve the students in teaching process which ignites the students' inquisitiveness and also provide better clarity and logic about the theories.

Encourages Innovation: STEM Centre boost the confidence among the students by educating them with science and mathematics concepts. The new-found scientific temperament in them encourages them to transform their innovative into reality.

Promotes Creativity: Creativity cannot sustain without Science. Whether it is an engineer or an architect, they have to be well versed with science and mathematics theories to create a sustainable design. The knowledge of STEM will allow the creative to use the material and space effectively.

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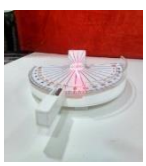
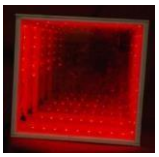
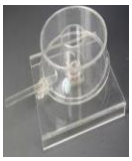
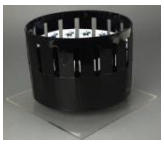
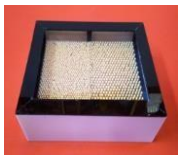
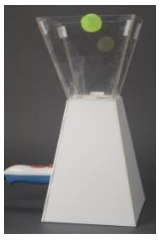
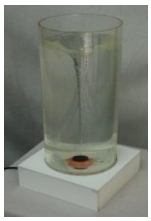
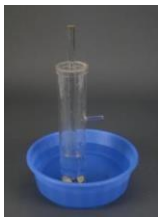
SWOT Analysis:

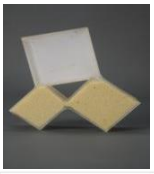
STRENGTHS (Internal factors)	WEAKNESS (Internal factors)
✓ Timely set up of MSC. ✓ 80 Models& backdrops aligned with curriculum. ✓ Structured TTP. ✓ Planned Follow-up M&E Process. ✓ WhatsApp Group for better connectivity & response. ✓ Vibrant Volunteer engagement programs.	✓ Probable delay in delivery in models for MSC.
STRENGTHS (EXTERNAL FACTORS)	**WEAKNESSS (EXTERNAL FACTOR)**
✓ Only structured program that has been certified by 7 SCERTS aligning with educational curriculum. ✓ Trust of more than 150 donors. ✓ Successfully implemented Program Pan India in 24 states in more than 2000 schools.	✓ School withdrawal or no support. ✓ Non-Availability for training on scheduled dates.
OPPORTUNITY (INTERNAL FACTORS).	**THREAT (INTERNAL FACTORS).**
✓ Constantly up grading its process and offerings. ✓ Constant development of new modules.	✓ None, as the organization is managed by professionals and overseen daily by its Founder and MD.
OPPORTUNITY (EXTERNAL FACTORS)	**THREAT (EXTERNAL FACTORS).**
✓ To constantly better our TTP and M&E by learning's, experience and donor value addition.	✓ Probable non acceptance of additional responsibility by school administration. ✓ Probable delay in taking ownership beyond the project period.

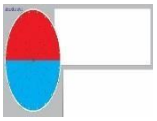
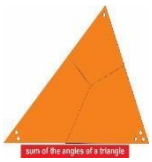
List of 80 Exhibits				
Sl. No.	Exhibit	Image	Concepts	CBSE Board Mapping
1.	Constellation Viewer		Identification and study of Indian constellations About ConstellationsStars Pattern	i)Std 8'th-17.Our Universe
2.	Newton's Disc		White light is made up of 7 colors(VIBGYOR). Splitting of white light.	i)Std 7'th-15.Light ii)Std 8'th-16.Light iii)Std 10'th-11.The Human Eye and the colorful world
3.	Colour Shadow		Combinations of colour lights. Additivemixture of colour. Primary colors.	i)Std 6'th-11.Light, Shadowsand Reflection
4.	Periscope		Application of laws of reflection. Angle of incidence and angle of reflection	i)Std 6'th-11.Light, Shadowsand Reflection ii)Std 7'th-15.Light iii)Std 8'th-15.Light
5.	Kaleidoscope		Multiple reflection. Symmetric images. Patterns due to reflection	i)Std 6'th-11.Light, Shadowsand Reflection ii)Std 6'th-13.symmerty (Math's) iii)Std 7'th-15.Lightiv)Std 8'th-16.Light
6.	Laws of Reflectio n		Laws of reflection for plane mirror. Angle of incidence = angle of reflection.	i)Std 6'th-11.Light, Shadowsand Reflection ii)Std 7'th-15.Light iii)Std 8'th-16.Light iv)Std 10'th-10.Light - Reflection and Refraction

7.	Corner Mirror		Multiple reflection. Image formula (N=360/A - 1) Angled mirrors.	i)Std 6'th-11.Light, Shadowsand Reflection ii)Std 7'th-15.Light iii)Std 8'th-16.Light
8.	Infinity Tunnel		Multiple reflections. Image formation in parallel mirrors.	i)Std 6'th-11.Light, Shadowsand Reflection ii)Std 7'th-15.Light iii)Std 8'th-16.Light
9.	Magic Water Tap		Optical Illusion. Refractive index of medium, refraction	i)Std 10'th-10.Light - Reflection and Refraction
10.	Total Internal Reflection.		Total internal reflection, bending of light ray. Optical fibre	i)Std 10'th-10.Light - Reflection and Refraction
11.	Fun with Magnets		Types of magnets Magnetic field andproperties of field lines.	i)Std 6'th-13. Fun withMagnets ii)Std 10'th-13.Magnetic effects of electric current ii)Std 10'th-13.Matter in our surroundings
12.	Law of Inertia		Newton's first law. Inertia is opposing change in state of rest.	i)Std 9'th-9.Force and Lawof Motion

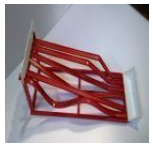
13.	Circle and Ball		Newton's first law. Inertia is opposing change in motion. Centripetal force.	i)Std 9'th-9.Force and Lawof Motion
14.	Action and Reaction		Newton's 3rd law of motion. For every action there is equal opposite and reaction	i)Std 9'th-9.Force and Lawof Motion
15.	Parrot in the Cage		Persistence of vision. Frames per second. The basic concept of animation.	i)Std 8'th-16.Light
16.	Zoetrope		Persistence of vision. Frames per second. The basic concept of motion picture.	i)Std 8'th-16.Light
17.	Pin screen		Pressure Inverse relation of Pressure Area Representation of Pixels	i)Std 9'th-9.Force and Lawof Motion
18.	Floating Ball		Bernoulli's principle. Pressure difference and lift.	i)Std 7'th-8.Winds, Stormsand Cyclones

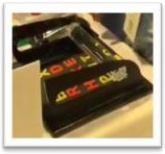
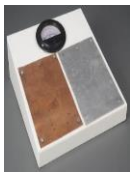
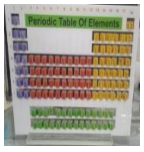
19.	Floating Fan		Bernoulli's principle. Air pressure difference	i)Std 7'th-8.Winds, Stormsand Cyclones
20.	Tornado		Atmospheric disturbances, currents, storms. Vortex of wind.	i)Std 7'th-8.Winds, Stormsand Cyclones ii)Std 8'th-15.Some Natural Phenomena
21.	Hand Pump		Application of pressure to pump water. Pressure-volume relation.	i)Std 7'th-11.Transportation in Animals and Plants ii))Std 10'th-6.Life Process
22.	Anamorph		Perspective, Viewpoints Illusion and Graphical projection	Std. 10 Chapter. 11. The Human eye and The colourful Word
23.	Floating Magnets		Properties of magnet. Attraction in opposite poles and repulsion in like poles	i)Std 6'th-13. Fun withMagnets ii)Std 8'th-11.Force and Pressure
24.	Magnetic Field Tube & Immiscible Fluid		Magnetic field and properties of magnets. Density of liquid	i)Std 6'th-13. Fun withMagnets ii)Std 10'th-13.Magnetic effects of electric current ii)Std 10'th-13.Matter in our surroundings

25.	Moment of inertia		Moment of inertia Rotational inertia. Distribution of mass.	Std. 10 Chapter. 6. Force and Pressure
26.	Lazy Tube		Magnetic Field and Forces, Eddy current,Lenz Law.	i) Std 6'th-13. Fun withMagnets ii) Std 10'th-13.Magnetc effects of electric current
27.	Hyperbola		Conic sections. Shapeof hyperbola.	i)Std 8'th-16.Light (Persistence of vision)
28.	Magnetic effect of electric current		Magnetism Magnetic effects of electric current. Compass deflection. Oesterd's experiment	Std. 10 Chapter. 13. Magnetic Effect of Electrical Current
29.	Pythagoras Model & MoirePattern	 	Pythagoras theorem and Interference of Light	i) Std 7'th-6.The Triangleand its Properties ii) Std 9'th-9.Areas ofParallelograms and triangles iii) Std 10'th-6.Triangles Std 10. Chapter. 10. Light-Reflection and Refraction
30.	Elliptical Carrom Board		Conic sections. Properties of ellipse.	i)Std 8'th-13.Sound ii)Std 9'th-12.Sound

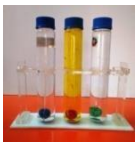
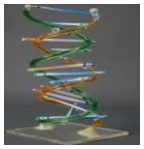
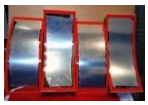
31.	Two Congruent Right Triangles		Comparison of area of different geometric shapes. Congruent shapes.	i) Std 6'th-5.Understanding Elementary Shapes ii) Std 7'th-11. Perimeter and Area
32.	Area of a Circle		Simple illustration of derivation of area of circle	i) Std 6'th-5.Understanding Elementary Shapes ii) Std 7'th-11. Perimeter and Area iii) Std 10'th-12.Areasrelated to circle
33.	$(a+b)^2 = a^2+2ab+b^2$		Geometric illustration of basic algebraic identity.	i) Std 7'th-12.Algebraic Expression ii) Std 8'th-19.Algebraic expression and Identities iii) Std 9'th-2.Polynomials
34.	$(a+b+c)^2 = a^2+b^2+c^2+2ab+2bc+2ca$		Geometric illustration of basic algebraic identity.	i) Std 7'th-12.Algebraic Expression ii) Std 8'th-19.Algebraic expression and Identities iii) Std 9'th-2.Polynomials
35.	a2-b2=(a+b) (a-b)		Geometric illustration of basic algebraic identity.	i) Std 7'th-12.Algebraic Expression ii) Std 8'th-19.Algebraic expression and Identities iii) Std 9'th-2.Polynomials
36.	Sum of the angles of a triangle		Elementary theorem of math. "Sum of all three angles of any triangle=180 ° Linearpair.	i) Std 6'th-5.Understanding Elementary Shapes ii) Std 7'th-6.The Triangleand its Properties

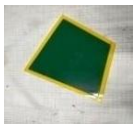
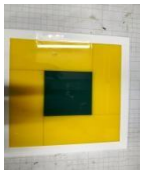
37.	Tangram		Interesting tiling puzzle. Basic geometric shapes.	To all standard
38.	Parking Puzzle &T puzzle	 	Mathematical logic Algorithm Brain Teaser Tiling Puzzle	To all standard
39.	Organ pipes		Sound of different frequencies and wavelengths. Musicalnotes.	i)Std 8'th-13.Sound ii)Std 9'th-13.Sound
40.	Area of rhombus		Simple illustration of derivation of area of rhombus	Std. 10 Chapter. 6. Area and mensuration
41.	Transverse wave pendulum		Mechanical wave. Basic concepts of transverse wave. Actual Representation of vibrating particles and propagating wave	i)Std 8'th-13.Sound ii)Std 9'th-13.Sound
42.	Area of triangle		Simple illustration of derivation of Area of Triangle	Std. 10 Chapter. 6. Area and mensuration

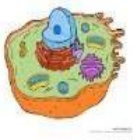
43.	Area of parallelogram		Simple illustration of derivation of area of parallelogram	Std. 10 Chapter. 6. Area and mensuration
44.	Coupled Pendulum		Resonant frequency. The resonant frequency depends on the pendulum's length. Longer pendulums have lower frequencies.	i)Std 6'th-10.Motion, and Measurement of Distances ii)Std 7'th-13.Motion and time
45.	Solar Light		Conversion of solar energy into electricity. Application of renewable energy sources. Solar panel, semiconductors.	i)Std 10'th-14.Sources ofEnergy
46.	Wind Mill		Working of wind mill. Conversion of wind energy into electricity.	i)Std 10'th-14.Sources ofEnergy
47.	Shape of earth due to rotation		Shape of earth Rotational force Centrifugal force	Std. 10 Chapter- 6.Gravitation
48.	KE PE Track		Conversion of energy. Potential and Kinetic energy.	i)Std 6'th-10.Motion, and Measurement of Distances ii)Std 7'th-13.Motion and time iii)Std 9'th-11.Work andenergy

49.	Loop The Loop		Conservation of energy. The minimumspeed necessary to complete the loop without falling.	i)Std 9'th-11.Work andenergy
50.	Rope Puzzle		Logic and Mathematical shapes study of surfaces	to all standard
51.	Refraction Cylinder		Refraction of light Alphabet symmetry	Std. 10 Chapter. 10. Light-Reflection and Refraction
52.	Newton's Cradle		Conservation of energy, conservation of momentum and friction.	i)Std 9'th-9.Force and Lawof Motion
53.	Centrifuge Puzzle		Centripetal and Centrifugal force.	i)Std 5'th-11.Sunita in spaceii)Std 9'th-8.Motion ,10.Gravitation
54.	Hand Battery		Electric potential difference. Electric battery. Chemical effect of electric current	i)Std 10'th-3.Metals & Non -Metals
55.	Periodic Table		Atomic Number and Periodic Classificationof Elements	Std. 10 Chapter. 5 Periodic Classification of Elements

56.	Cone Run Uphill		Centre of mass.Gravitypulls on the center of mass of objects.	i)Std 9'th-10.Gravitation
57.	Tower Of Pisa		Center of mass. Centre of gravity. Gravitation. Stabilityof structure.	i)Std 9'th-10.Gravitation
58.	Lever		Simple Machines Lever. Type of lever.	i)Std 9'th-11.Work andenergy
59.	Pulley Block		Pulley- simple machine. Combinationof pulley. Mechanical Advantage.	i)Std 9'th-11.Work andenergy
60.	Wheel and Axel		How it is easy to rotate wheel when force is applied at a point distant from center.	i)Std 9'th-11.Work andenergy
61.	Heat Absorption		Black Body, Heat Absorption and Reflection, Colour Temperature	Std. 7 Chapter -4.Heat
62.	Day and Night		Cycle of day and night on earth. Shadows. Seasons, angle of tilt.	i)Std 8'th-17.Stars and TheSolar system

63.	Viscosity Tube		Buoyancy. Viscosity. Density	i)Std 5'th-7.Experimentswith water ii`)Std 9'th-10.Gravitation
64.	Rock and Minerals		Different types of rock and mineral samples. Differencebetween them.	i`)Std 9'th-14.NaturalResources
65.	DNA		Double helix structure of DNA. A-T and G-C pairs.	i`)Std 10'th-9.Heredity andEvolution
66.	Lateral Shift		Refraction of light,deviation in path.	Std. 10 Chapter. 10 Light - Reflection and Refraction
67.	Force & types of friction		Friction, speed due to surface texture. Rolling Friction.	Std. 9 Chapter-11. Work And Energy
68.	Funny mirrors		Distorted mirror. Convex and concavemirrors	Std. 10 Chapter. 10 Light - Reflection and Refraction
69.	Marble Slide		Conservation of momentum.	Std. 9 Chapter- 9.Force and lawsof motion

70.	Resonance		Frequency and length of object, resonating frequency.	Std. 9 Chapter-. 4. Sound
71.	Weight Illusion		Weight Illusion Volume and Density	Std. 9 Chapter- 1.Matter - Its Nature & Behavior
72.	Area of Trapezium		Area of trapezium using parallelogram	Std. 10 Chapter. 6. Area and Mensuration
73.	Sum of angles of Quadrilateral		Sum of angles of Quadrilateral Complete angle	i) Std 6'th-5.Understanding Elementary Shapes ii) Std 9'th-6.The Quadrilateral
74.	(A+B)^2 - (A-B)^2 = 4AB		Geometric illustration of basic algebraic identity.	i) Std 7'th-12.Algebraic Expression ii) Std 8'th-19.Algebraic expression and Identities iii) Std 9'th-2.Polynomials
75.	Electric bell		Electric Circuit, Electromagnet and magnetic effects of current	1) Std - 7th – 14 Electricalcurrents and its effects. 2) Std - 10th - 12. Magneticeffects of Electric Current.
76.	Human Torso		Human Body Anatomy Organs Functions of Body parts	Std 6 Chapter 8 Body Movements

77.	Ear & Eye	 	Sense organs Functions of bodyparts Vision Hearin g	Std 5 Chapter 1 Super Senses
78.	Human Joints		Types of joint In human body Bones and ligaments	Std 6 Chapter 8 Body Movements
79.	Plant Cell		Eukaryotic cells Difference between cells Parts of cell	Std 9 Chapter 5 The Fundamental Unit of Life
80.	Animal Cell		Difference between cells, Parts of cell	Std 9 Chapter 5 The Fundamental Unit of Life

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Building Brains.....Beyond Books.....

❖ Financial Budget for Setting up of 1 mini Science Centers in 1 Govt. Schools for the Duration Of 1 year

The budget is for 1 school for 1 MSC for 1 Year					
SR.NO	ITEM	DESCRIPTION	COST	NOS OF SCHOOLS	TOTAL
1	MINI SCIENCE CENTRE	80 MODELS + 80 USERS PLACARD+ 37 COLOURFUL BACKGROUNDS + 1 SAFETY PLACARD + 1 TEACHERS MANUAL+ 1 GATE BANNER INCLUDES INSTALLATION & DELIVERY	3,31,949	1	3,31,949
		TAXES @ 18%	59750.82		59750.82
		TOTAL	3,91,700	1	3,91,700
2	TRAINING OF TEACHERS (TTP)	TEACHERS TRAINING PROGRAMME -2 (FRESHER TEACHERS TRAINING PROGRAMME - FTTP & REFRESHERS TEACHERS TRAINING PROGRAMME - RTTP)	40,000	1	40,000
		TAXES @18%	7200		7200
		TOTAL	47,200	1	47,200
3	MONITORING & EVALUATION	TOTAL - 2 VISITS IN INDIVIDUAL SCHOOLS TO CONDUCT BASELINE & ENDLINE SURVEY	40,000	1	40,000
		TAXES @ 18%	7200		7200
		TOTAL	47,200	1	47,200
4	ANNUAL MAINTENANCE CONTRACT	CLEANING SERVICING & IF REPLACEMENT (if any)	40,000	1	35,000
		TAXES @ 18% (cost applicable from second year)	7,200		6300
		TOTAL	47,200	1	0
5	INFRASTRUCTURE	SET UP OF PLATFORMS & ELECTRIC CONNECTIONS	40,000	1	40,000
		TAXES @18%	7,200		7,200
		TOTAL	47,200	1	47,200
TOTAL (1+2+3+5)			**5,33,300**	1	**5,33,300**
		NET COST FOR PER SCHOOLS (1+2+3+5)	**4,51,949**	1	**4,51,949**
		GST@18%	**81,351**	1	**81,351**
		TOTAL COST INCLUDING GST	**5,33,300**		**5,33,300**

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THANK YOU

STEM LEARNING