Implementing Partner:

STEM Learning – "A Social Enterprise"

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Mini Science Centre

Teacher Training Program

Science Competition (NSP)

DIY – Model Making

Proposal for establishing of Mini Science Centre under the CSR Initiative of Meenakshi Mines (Hindalco) in 2(Two) Schools at Sundargarh, Odisha

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 130+ 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 8000+ teachers in 1900 + schools across 24 states in India. In addition to this, STEM learning also has a niche in installing 30 big science Centre's in different talukas of Maharashtra under Manav Vikas Mission Project of Maharashtra Government. 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 8 ***SCERTs***- *Maharashtra, Goa, Chhattisgarh, Odisha, Nagaland, West Bengal 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 500 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 27 states of India and has proven our process of Installation, delivery of 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. Punjab 21. Odisha 22. Dadra and Nagar Haveli 23. Assam 24. Manipur 25. West Bengal

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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 33 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.

Expected outcome of the program:

- Aptitude of students for learning science and mathematics improved by creating simple, child friendly eco system which is fun and enjoyable.
- Empowering teachers with easy teaching aids.
- Improve teaching pedagogy by use of models in conducting the science and math's class through better engagement of teachers in teaching.
- Increased enrolment and interest in STEM-related courses in school.
- Continued participation in STEM programming.
- Increased self-confidence in tackling science & Math's classes and projects.
- Shift in attitude about careers in STEM.
- Increased test scores as compared to non-participants.
- Increased general knowledge of science & math's-based concepts.
- Gains in 21st century skills, including communication, teamwork, and analytical thinking.
- 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 an city travel, ri of covid-19 infection • Multiple visi to schools an 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 33 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 for 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 MS benefit will b communicate
MSC-Maintenance	• PIA along with MSC technical person, free maintenance drive is conducted. • Aim: Learning shouldn't stop; student can use MSC independently	• Continuous and Maximum utilization of MSC for sustainable use	• Quality check of MSC by Team technician • Repair and place if needed • Maintenance report created • MSC model utilization register maintained	3rd quarter	
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	• 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	• RTTP scheduled • RTTP with PPT will be conducted • Feedback & suggestion from teachers • TTP report created for documentation	3nd quarter	

	• Training to refresh best usage of MSC for maximum utilization	math			
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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Mini Science Centre:

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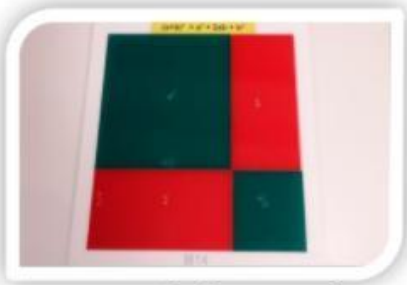
me of Our MSC Models:



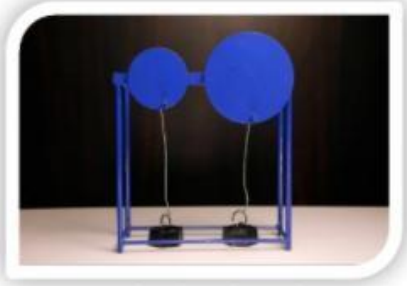
$(a+b)^2=a^2 + 2ab + b^2$

Floating Magnets

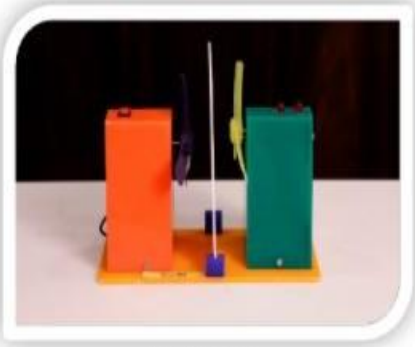
Pythagoras

Pin Screen

Conductors-and-insulators



Wheel-and-axel

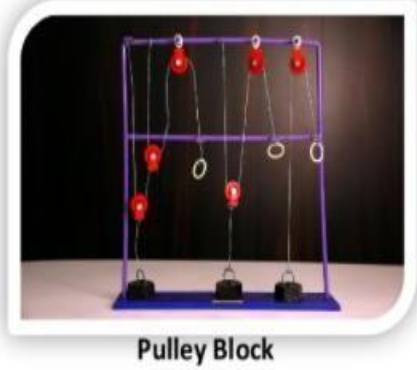


Windmill

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												

Outcomes/Result expected:

- Improvement of aptitude of the students in regards of science and mathematics.
- Development of inquisitiveness, critical thinking, problem solving skills and creativity of students.
- Enhancing the skills of teachers by training them to teach in a practical manner.
- Improve teaching pedagogy by use of models in conducting the science and math's class through better engagement of teachers in teaching.
- Strengthening of concepts of Science and Mathematics.

Project Location & Support Request:

Establishing of Mini Science Centre under the CSR initiative of Meenakashi Mines (Hindalco) in 2 (Two) schools at Sundargarh district of Odisha.

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 a 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 must 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.

STRENGTHS (Internal Factors)	WEAKNESS (Internal Factors)
✓ Timely setup 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.

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STRENGTHS(EXTERNALFACTORS)	WEAKNESSS(EXTERNALFACTOR)
✓ 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.

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: Budget for the establishment of 2 (Two) Mini Science Centers (MSC) in Odisha

The budget is for 2 Schools for 2 MSC for 1 Year					
SR.NO	ITEM	DESCRIPTION	COST	NOS OF SCHOOLS	1st Year
1	MINI SCIENCE CENTRE	80 MODELS + 80 USERS PLACARD+ 37 COLOURFUL BACKGROUNDS + 1 SAFETY PLACARD + 1 TEACHERS MANUAL+ 1 GATE BANNER INCLUDES INSTALLATION & DELIVERY	3,06,949	2	6,13,898
		TAXES @ 18%	55250.82	2	110501.6
		TOTAL	3,62,200	2	7,24,400
2	TRAINING OF TEACHERS (TTP)	TEACHERS TRAINING PROGRAMME -2 (FRESHER TEACHERS TRAINING PROGRAMME - FTTP & REFRESHERS TEACHERS TRAINING PROGRAMME - RTTP)	40,000	2	80,000
		TAXES @18%	7200	2	14400
		TOTAL	47,200	2	94,400
3	MONITORING & EVALUATION	TOTAL - 2 VISITS IN INDIVIDUAL SCHOOLS TO CONDUCT BASELINE & ENDLINE SURVEY	40,000	2	80,000
		TAXES @ 18%	7200	2	14400
		TOTAL	47,200	2	94,400
4	ANNUAL MAINTENANCE CONTRACT	CLEANING SERVICING & IF REPLACEMENT (if any)	40,000	2	80,000
		TAXES @ 18% (cost applicable from second year)	7,200	2	0
		TOTAL	47,200	2	47200
5	INFRASTRUCTURE	SET UP OF PLATFORMS & ELECTRIC CONNECTIONS & WHITE WASH	36,780	2	73,560
		TAXES @18%	6,620	2	13,241
NET COST FOR PER SCHOOLS (1+2+3+5)			43,400	2	86,801
TOTAL COST INCLUDING GST			**5,00,000**	**2**	**10,00,000**

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THANK YOU
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