

STEM Education in India: A Path to Innovation

Empowering Students for a Bright Future

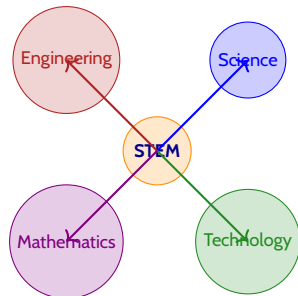
Facilitator: Dr. Sandeep Suman
University Department of Mathematics
T.M. Bhagalpur University, Bhagalpur
Email: ssumantbmu@gmail.com

June 28, 2025

Organised by ANG Sahodaya, Bhagalpur

Session Overview

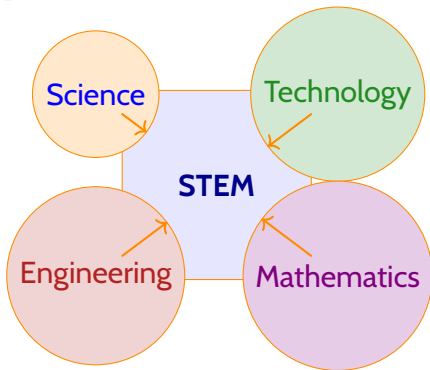
- Discover what **STEM** education is and why it matters
- Learn about STEMs origins in India and globally
- Explore how STEM helps students create, solve problems, and work together
- Understand challenges and solutions for STEM in Indian schools
- Align with the National Education Policy (NEP) 2020



What is STEM Education?

STEM stands for **Science**, **Technology**, **Engineering**, and **Mathematics**. Its a way of learning that solves **real-world problems!** [2]

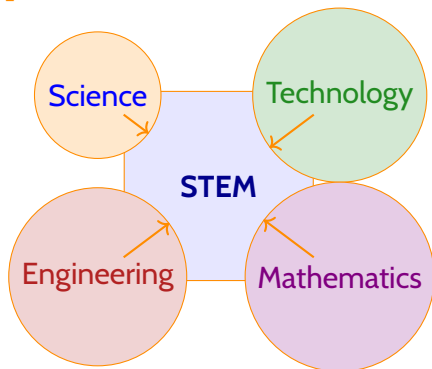
- **Science:** How the world works (e.g., plant growth).
- **Technology:** Tools like apps or robots.
- **Engineering:** Build bridges or machines.
- **Mathematics:** Analyze data, solve problems.



What is STEM Education?

STEM stands for **Science**, **Technology**, **Engineering**, and **Mathematics**. Its a way of learning that solves **real-world problems!** [2]

- **Science:** How the world works (e.g., plant growth).
- **Technology:** Tools like apps or robots.
- **Engineering:** Build bridges or machines.
- **Mathematics:** Analyze data, solve problems.



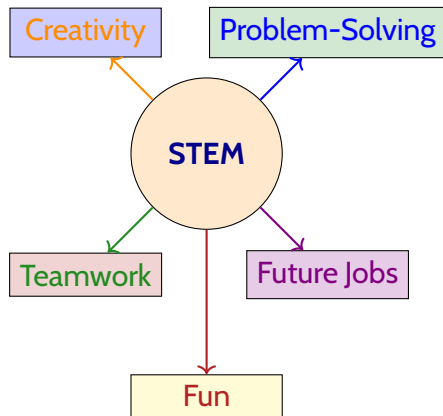
STEM is about hands-on projects, critical thinking, and teamwork!

Why STEM Matters

STEM makes learning exciting and prepares students for the future:

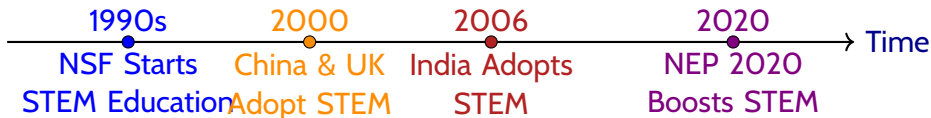
- **Creativity:** Design games or models [3].
- **Problem-Solving:** Solve challenges like clean water.
- **Teamwork:** Collaborate like scientists.
- **Future Jobs:** Prepare for tech careers like AI [4].
- **Fun:** Experiments and coding!

Activity: What STEM project would you like to try?



Origins of STEM Education

- **Global:** Began in the 1990s by the NSF to enhance science and math learning [5].
- **Influencers:** MIT and Stanford pioneered projects like robotics [3].
- **China & UK:** Adopted STEM education in 2000 [6].
- **India:** Began adopting STEM in 2006, boosted by NEP 2020 [2].
- **Example:** Schools use Scratch for coding and math [3].



Challenges of STEM in India

- **Limited Resources:** Lack of computers or tools in schools [6].
- **Teacher Training:** Need for more STEM training [1].
- **Exam Pressure:** Focus on exams over projects.
- **Unequal Access:** Fewer STEM opportunities in rural schools [6].

Challenges of STEM in India

- **Limited Resources:** Lack of computers or tools in schools [6].
- **Teacher Training:** Need for more STEM training [1].
- **Exam Pressure:** Focus on exams over projects.
- **Unequal Access:** Fewer STEM opportunities in rural schools [6].

Discussion: What challenges do you see for STEM in your school?

Limited Resources

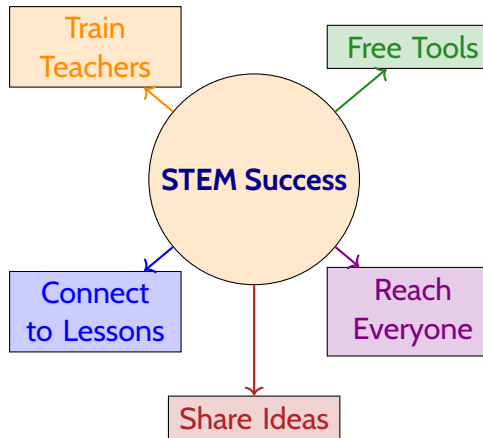
Teacher Training

Exam Pressure

Unequal Access

Solutions for STEM Success

- **Use Free Tools:** Scratch or GeoGebra for coding and math [3].
- **Train Teachers:** More workshops for teachers [1].
- **Connect to Lessons:** Link STEM projects to subjects.
- **Reach Everyone:** STEM kits for rural schools [6].
- **Share Ideas:** Share projects at events.



Wrap-Up

- STEM combines science, tech, engineering, and math for fun learning.
- Helps students create, solve problems, and prepare for the future.
- Challenges can be solved with free tools and training.
- **Next Steps:** Try a STEM project or join an event!



References I

- [1] Central Board of Secondary Education. Guidelines for stem education and project-based learning. *CBSE Academic Circular*, 2024.
- [2] Ministry of Education, Government of India. *National Education Policy 2020*. Government of India, New Delhi, 2020.
- [3] MIT Scratch Team. Scratch: Programming for all. <https://scratch.mit.edu>, 2023. Accessed: 2025-06-28.
- [4] NASSCOM. Indias technology sector: Growth and opportunities 2024. *NASSCOM Report*, 2024.
- [5] National Science Foundation. Shaping the future: New expectations for undergraduate education in science, mathematics, engineering, and technology. *NSF Report*, 1996.
- [6] UNESCO. Education for sustainable development: Addressing equity in stem. *UNESCO Education Report*, 2024.

Thank you for your engagement!

Lets inspire students with STEM innovation!