# Introduction

## What is Stem Education

STEM is an abbreviation that stands for science, technology, engineering, and mathematics (STEM) and shows how these four disciplines could be grouped together. STEM is an interdisciplinary approach to learning where academic concepts are coupled with real-world lessons. Students apply science, technology, engineering, and mathematics in contexts that make connections between the classroom and the world around them. [1]

STEM is important because it pervades every part of our lives. Science is everywhere in the world around us. Technology is continuously expanding into every aspect of our lives. Engineering is the basic designs of roads and bridges, but also tackles the challenges of changing global weather and environmentally friendly changes to our home. Mathematics is in every occupation, every activity we do in our lives.

A curriculum that is STEM-based has real-life situations to help the student learn. Programs like Engineering For Kids integrates multiple classes to provide opportunities to see how concepts relate to life in order to hopefully spark a passion for a future career in a STEM field. STEM activities provide hands-on and minds-on lessons for the student. Making math and science both fun and interesting helps the student to do much more than just learn.

Now let’s examine the four of these disciplines in detail (Box 1-1):

**BOX 1-1**  
**The Four STEM Disciplines**

***Science*** is the study of the natural world, including the laws of nature associated with physics, chemistry, and biology and the treatment or application of facts, principles, concepts, or conventions associated with these disciplines. Science is both a body of knowledge that has been accumulated over time and a process—scientific inquiry—that generates new knowledge. Knowledge from science informs the engineering design process.

***Technology***, while not a discipline in the strictest sense, comprises the entire system of people and organizations, knowledge, processes, and devices that go into creating and operating technological artifacts, as well as the artifacts themselves. Throughout history, humans have created technology to satisfy their wants and needs. Much of modern technology is a product of science and engineering, and technological tools are used in both fields.

***Engineering*** is both a body of knowledge—about the design and creation of human-made products—and a process for solving problems. This process is design under constraint. One constraint in engineering design is the laws of nature, or science. Other constraints include time, money, available materials, ergonomics, environmental regulations, manufacturability, and reparability. Engineering utilizes concepts in science and mathematics as well as technological tools.

***Mathematics*** is the study of patterns and relationships among quantities, numbers, and space. Unlike in science, where empirical evidence is sought to warrant or overthrow claims, claims in mathematics are warranted through logical arguments based on foundational assumptions. The logical arguments themselves are part of mathematics along with the claims. As in science, knowledge in mathematics continues to grow, but unlike in science, knowledge in mathematics is not overturned, unless the foundational assumptions are transformed. Specific conceptual categories of K–12 mathematics include numbers and arithmetic, algebra, functions, geometry, and statistics and probability. Mathematics is used in science, engineering, and technology.

SOURCE: Adapted from NRC (2009).

## Purpose

The purpose of this document is to propose a new way of educating the students according to the demands of the 21st century which could help them to learn more effectively, rapidly and in a interesting way that could prepare them for the future. Even this gives us a comparative study between the conventional methods of education vs the idea we propose.

## Scope

In an ever-changing, increasingly complex world, it's more important than ever that our nation's youth are prepared to bring knowledge and skills to solve problems, make sense of information, and know how to gather and evaluate evidence to make decisions.

If we want a nation where our future leaders, neighbors, and workers have the ability to understand and solve some of the complex challenges of today and tomorrow, and to meet the demands of the dynamic and evolving workforce, building students' skills, content knowledge, and fluency in STEM fields is essential. We must also make sure that, no matter where children live, they have access to quality learning environments. A child's zip code should not determine their STEM fluency. No matter from which every country he belongs the same level of education should be ensured.

The scope of this extends beyond the learning of an individual it effects on the economic growth of the country as well. According to CEO magazine [3]:

“To ensure continued economic growth, it is more important than ever for the nation’s education system to focus on STEM courses. According to PwC (PricewaterhouseCoopers), changing just 1% of the workforce into STEM roles would add $57.4 billion to Australia’s gross domestic product (GDP). Without investment in STEM subjects, Australia could drop out of the top 20 economies by 2050.”

## Current situation of education

## Why is STEM necessary in current era

## What makes STEM different from other system

1. Principles of STEM education

## How it works

## Pros and Cons of it

## How STEM is divided into levels

## How much change can it bring

1. Findings and Discussion

## Workforce required to implement STEM

## Organizations we can collaborate with

## Beneficiaries of our project

## Workbreakdown structure

1. Conclusion