The prime objective of this chapter is to provide an overview of the importance of mathematics in our day to day life. It also infers the effect of taken variables on the attitude of mathematics.

1.1 What is Mathematics:

Mathematics is called as the queen of all sciences. It surely impacts our day to day life. It works as an essential tool in many fields be it in medicines, be it in engineering, social sciences or in administration. Starting from a farmer to a researcher everyone's day starts with mathematics. It is very essential for everyone to have a sound understanding of at least the basic mathematical skills.

1.2 Definitions of Mathematics:

Kline, M (1967) in a debate on 'Modern Mathematics' says: "Mathematics is a creative or inventive process, deriving ideas & suggestions from real problems, idealizing and formulating the relevant concept, posing questions, intuitively deriving a possible conclusion and then only then proving the hunch or intuitive arguments deductively"

Auguste Comte defined mathematics as: "The science of indirect measurement."

According to **Benjamin Peirce**: "Mathematics is the science that draws necessary conclusions."

According to **Oxford English Dictionary**: "Mathematics is the abstract science which investigates deductively the conclusions implicit in the elementary conceptions of spatial and numerical relations, and which includes as its main divisions geometry, arithmetic, and algebra."

Aristotle defined mathematics as: "The science of quantity."

1.3 Utility of Mathematics in day-to-day life:

Mathematics makes a man methodical and systematic. Certain qualities that are nurtured by mathematics are power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem-solving ability and even effective communication skills. Mathematics is the cradle of all creations. Be it a cook or a farmer, a carpenter or a mechanic, a shopkeeper or a doctor, a musician or a magician, everyone need math in their day to day life. Snails make their shells, spiders design their webs, bees make hexagonal combs. There are countless examples of mathematical patterns in nature.

1.4 The NCF 2005 recommends:

Shifting the focus of mathematics education from achieving narrow goals of mathematical content to higher goals of creating mathematical learning environments, where processes like formal problem solving, use of heuristics, estimation and approximation, optimisation, use of patterns, visualisation, representation, reasoning and proof, making connections and mathematical communication take precedence.

- Engaging every student with a sense of success, while at the same time offering conceptual challenges to the emerging mathematicians.
- Changing modes of assessment to examine students' mathematisation abilities rather than procedural knowledge.
- Enriching teachers with a variety of mathematical resources.

NCF-2005 says that the tall shape of mathematics can be de-emphasized in favour of broad based curriculum with more topics that start from the basics. Revisiting the basics of mathematics at secondary

and higher secondary stages will help children make better use of their time at school.

NEP 2020 will help India regain its love for mathematics. Because the applications of mathematics are extensive and diverse, by introducing the multidisciplinary curriculum and credit-based mechanism, NEP provides flexibility to students to apply their knowledge. National Education Policy 2020 has significant provision and provides a platform to build, nurture, foster, encourage and multiply mathematical thinking. It has introduced the reforms needed to balance the need for 21st century employment and entrepreneurship, which is marked by critical, lateral and mathematical thinking. The NEP appreciated the necessity of Mathematical thinking and its importance for the country to become a vishwaguru.

1.5 Mathematics as a School subject:

The history of mathematics is the story of the progress of civilisations and culture. "Mathematics is the mirror of civilisation."

Egyptian and Babylonian civilisations have given a pertinent position to mathematics. They considered it as a subject to be learnt in order to perform daily life activities in a better way. Elementary arithmetic and algebra were built up to solve the problems related to commerce and agriculture. Since ancient times, the subject of mathematics has been given a pivotal position due to its utilitarian and disciplinary values.

Mathematics teaches us how to analyse a situation, how to come to a decision, to check thinking and its results, to perceive relationships, to concentrate, to be accurate and to be systematic in our work habit.

Mathematics has helped in bringing together the countries of the world which are separated from each other physically.

1.6 Need of the Study:

According to NCF 2005, "The emphasis for learning mathematics is that all students can learn the need to learn mathematics. Pedagogy and learning environment have to be made favourable for students to develop interest by going far beyond basic skills and include variety of mathematics loving models by pedagogy which devotes a greater percentage of instructional time to problem solving and active learning. Mathematics makes learner systematic, confident, self-evaluated, self-esteemed, self-reliable etc."

Mathematisation should be the focus in order to enhance the standard of life. Instead of teaching mathematics only for examination purpose, the teachers have to teach in such a way that learners will be able to link it in every aspects of life. This attitude needs to be inculcated in learners.

Mathematics is thought to be a difficult subject as compared to other subjects. With proper guidance from the teachers, this thinking of students will be able to be changed. For this, the attitude of students needs to be changed.

A shift from teacher centred education to learner centred Education made a great change. But whether learner centred education or Learning centred education? Which one is more applicable in all cases we have to figure it out. In order to find out the relevance of teaching learning mathematics in secondary schools we need to study the students' attitude towards the subject.

This research will pave a way in that direction. Understanding the attitude towards mathematics will be the main focus of this study.

1.7 Aims and Objectives of teaching Mathematics at secondary level:

At different times and in different cultures and countries, mathematics education has attempted to achieve a variety of objectives.

These are:

- The teaching and learning of basic numeracy skills to all pupils.
- The teaching of practical mathematics (arithmetic, elementary algebra, plane and solid geometry, trigonometry) to most pupils, to equip them to follow a trade or craft.
- The teaching of abstract mathematical concepts (such as set & function) at an early age.
- The teaching of selected areas of mathematics (such as Euclidean geometry) as an example of an axiomatic system and a model of deductive reasoning.
- The teaching of selected areas of mathematics (such as calculus) as an example of the intellectual achievements of the modern world.
- The teaching of advanced mathematics to those pupils who wish to follow a career in Science, Technology, Engineering, and Mathematics (STEM) fields.

Attitude is a general tendency of an individual to act in a certain way under certain conditions. Attitude towards mathematics is the feeling and emotions of mathematics. According to Dutt. N.K (1978), "Attitude underlies many of the significant dramatic instances of man's behaviour".

Mathematics is a powerful learning tool. Students should understand the relationship between understanding mathematics and solving the

everyday situations. The relationship between mathematics and other subject should be given emphasize.

It is studied that male students possess more positive attitude towards mathematics as compared to girls. This study is carried out to verify the pre researched notions that the male students have more positive attitude or not.

The attitude of students towards any subject is highly influenced by the teacher of that subject. Also in case of mathematics, it is indifferent. The attitude towards mathematics is highly influenced by the mathematics teacher. The nature of teacher varies from institution to institution. It is believed that there is a significant difference in the performance of students in relation to the governance of school i.e. whether the school is private of government, as the nature of the teacher varies.

In the present study the researcher wants to investigate the problems in mathematics at secondary stage in relation to 2 variables.

The variables are as follows:

- Gender
- Type of school(Government or Private)

1.8 Defining the Terms:

Attitude: Attitude is a general tendency of an individual to act in a certain way under certain conditions.

Secondary level: The secondary level is the third stage of school education consisting of standard IX & X.

Population: The population is the pool of individuals from which a statistical sample is drawn for the study.

Sample: A sample is a small portion of a population selected for the observation and analysis.

Variables: A variable is a symbol that stands for a value that may vary; the term usually occurs in opposition to constant, which is a symbol for a non-varying value.

Dimensions: In measurement context numerical values are expressed on well-defined scales. On the basis of mathematical and logical assumptions various types of scales are used in psychological measurement. In psychological measurement we rank people on some dimension to define scale.

1.9 Objectives:

The following study was undertaken keeping in view the following objectives.

- To construct the attitude scale to measure the attitude of the secondary school students towards mathematics.
- To study the attitude of secondary school students towards Mathematics.
  1. With respect to their gender
  2. With respect to the management of school (Government or Private)