It is generally observed that there are individual differences in ability to learn. Individuals differ in all measurable traits. So the most important psychological aspect of learners is individual difference. One can't find two children alike in all respects. Generally the differences are observed in (i) Learning ability (ii) General intelligence (iii) Biological factors such as age-maturity, health, fatigue and sex differences (iv) Personality characteristics (v) Previously acquired knowledge (in connection with positive and negative transfer) (vi) Basic skills (vii) Social values and goals. Hence one of the most demanding tasks of the teacher is to adjust materials and methods to meet the problems created by individual differences. Every school and every teacher makes some adjustment for the levels of performance and rates of progress expected from bright and dull children. During the past one decade or two, the tendency has been towards making more carefully planned provisions for individual difference in the classroom. With our increasing emphasis on the professional training of both teachers and administrators, and with continuous improvements in instructional materials and laboratory facilities, one can expect this trend to persist.
1.1 Some Educational plans to individualized instruction:

Many educational plans have been proposed and tried out which have made valuable contributions to educational practices. One of them is the Dalton Plan. It attempts to make instruction completely individualized and caters to the pupils' needs. The other plan is the Winnetka plan. It starts by identifying those core curricular elements that all children are expected to master. The core is broken into units, and each pupil works on unit, until he has achieved perfect or nearly perfect mastery. The core is so designed that a child of about 95 I.Q. or better is able to make a year's progress in a year's time.

This shows that numerous attempts have been made to adjust instruction to individual pupil's needs, but yet, no one plan has come to dominate in educational practice. This suggests that for meeting individual differences some new ways are still to be tried out for meeting the individual differences in learning. Besides the new techniques and approaches to be tried out, the skills of the teacher and co-operation among teachers will be of more importance than the exact plan used to accommodate individual differences. The programmed learning plan given by Dr. B.F. Skinner is one of the approaches to meet individual differences with regard to teaching learning process.

1.2 Programmed Learning Plan:

In Educational technology the programmed learning or
auto instructional device is individualized. Therefore only one person learns at a time. This device presents materials to be learnt in minimum increments. By proceeding in small steps, it obviously reduces the likelihood of errors. Because of the desire to hold the unexpected errors by the students to the minimum, each step in the learning process follows logically as well as closely to the one preceding it. In this device students make progress at their own rate. The answer of the student is almost instantaneously checked against the correct answer, which appears before the next question is asked. The very appearance of correct answer reinforces his learning.

The principles involved in the programmed-learning are reading, thinking, writing, checking, advancing and recording. More about programmed learning has been discussed elsewhere in this report with a view to making the concept of the programmed learning or auto instructional programmes clear.

But this innovative idea of programmed learning is successfully tried out in the countries like U.S.A., U.K., U.S.S.R. and Japan. This innovative idea is tried out in different developed countries and under-developed country like India. The idea has been given by Prof. B.F. Skinner. The work done by Skinner has been followed by Crowder Gilbert, Pressy, Home, Glasser and Evans. They have also contributed much to the development and the spread of this new idea. From this it can also be threshed out that this new idea is important in this knowledge explosion era. Looking to the importance of the programmed learning, it is very essential for class room
teachers not only to acquaint themselves with it, but to study its effectiveness also. If this plan proves to be successful in teaching, it will contribute a great deal to our classroom teaching practices. One of the major aims of teaching process is to induce better learning in pupils. Thus programmed learning contributes to the methodology of class teaching.

But the field of methodology of teaching is a field of experimentation by itself. A teacher always thinks about the better methods of imparting knowledge to pupils. Teaching-learning processes are modified according to the needs of the pupils and society as the age advances.

"Quite a few studies have proved that auto instructional programme has secured as much as, or better learning than conventional methods; sometimes even with a saving of time in classroom situations".1

Such efficiency is possible without the use of expensive machinery by providing a work book, a set of cards or paper machine in the form of auto instructional programmes.

1.3 The Present Study

Through years teachers have used a variety of methods for individualization of instruction. To-day auto

Instructional programme represents one of the most exciting new approaches towards this end. It aims at involving every student at every step of his learning process to teach him as an individual student. Whether this is possible will be determined by careful research and sober evaluation.

It is said that self-instructional programmes claims to make a definite contribution to education. Therefore uncritical acceptance or a premature rejection of the idea would be most unfortunate. If the programmed learning movement is discarded without having sufficient background of experimental findings, it would be a great loss to teachers in particular and the world at large. That is why the field of programmed learning needs much of experimentation in actual class rooms. It will provide the experimental evidences which may guide whether the programmed instruction will be suitable to Indian Conditions or not. Often it is mentioned that programmed learning is one of the important plans for individualizing instruction as it accommodates individual differences. It is the common feeling and experience of mathematics teachers that more individual differences are observed during teaching of mathematics. This problem is more serious with regard to the introduction of the syllabus of modern mathematics particularly in Geometry.

Moreover teaching of mathematics in our schools, needs improvement in several aspects. This could be done by developing teaching material suitable for different classes and pupils. Besides this, there is an obvious need to orient the school teachers and pupils in the techniques of preparing and using auto instructional programmes.
With this point in view, the present study is taken up by the investigator. The problem is as under.

1.4.0 Problem:

"TO DEVELOP AUTO-INSTRUCTIONAL PROGRAMMES IN GEOMETRY FOR STD. IX AND TO FIND OUT THEIR EFFECTIVENESS IN RELATION TO DIFFERENT VARIABLES".

1.4.1 Definition of terms:

Before planning for the research it is essential on the part of the investigator to define and clarify certain key words used in the wording of the problem. Such words are Auto-Instructional Programmes, Develop, Modern Geometry and Variables.

1.4.2 Auto-Instructional Programmes mean the educational materials from which students learn by themselves. In the present investigation the teaching technique is based on auto instructional programme called as programmed learning. Its purpose is to enable the student to progress through planned sequence of experiences for acquiring knowledge or skill. The planned sequence of experiences is said as programme.

Develop:

For the present auto-instructional material the investigator has not adapted or translated any material available in the market. He himself has developed the
material on the lines followed by the experts in the field. Therefore, it is implied that the investigator has followed all the steps and procedures for developing the present material.

Modern Geometry:

"The term modern Geometry is misleading because it leaves the impression that the entire content of the traditional Geometry has been replaced by something new. The new Geometry has been considered as change in old concept, language and symbols and approach whose functions are to provide a foundation for attaining the goals of modern Geometry. The approach is purely logical based on reasoning". 2

Variables:

Here the word variable means variant factors which could change or alter. The following variables have been taken into consideration for the purpose of studying the effectiveness of the auto-instructional programmes: intelligence, socio-economic status, time, ability in mathematics and approach of teaching.

Effectiveness:

"Effectiveness" emphasises the actual production of an effect when in use.

Tools used to find out the above stated variables are as follows:

1. Intelligence was measured by Dr. K.G. Desai Group Intelligence Test, standardized at Bombay University, Bombay.

2. Socio-economic status of the students. It was measured with Kuppuswamy's SES scale.

3. Ability in Mathematics. It was derived from the annual examination achievement score in mathematics.

After clarifying certain terms used in the statement of the problem, the next task before the investigator is to decide the objectives and hypothesis to be studied.

1.5 Objectives and Hypothesis:

1.5.1 Objectives: The objectives are as follows:

i. To analyse the syllabus of modern Geometry for Std. IX in terms of teaching points.

ii. To decide the entering behaviour.

iii. To develop the auto-instructional material in Geometry.

iv. To study the effectiveness of programmed learning in the context of different variants.
In order to study the effectiveness of programmed learning in relation to different variants following hypotheses are established and tested.

1.5.2 Hypotheses:

1. The students having I.Q. (80-90) may benefit more in learning Geometry through auto-instructional programmes, than through conventional methods.

2. The students having average I.Q. (100) may increase their rate of learning through auto-instructional programmes.

3. The students coming from the lower strata are likely to be benefitted more in learning Geometry through programmed learning.

4. The students learning through auto-instructional programmes may achieve more in Geometry than those taught through the conventional method, with a saving of time for learning.

5. The students having low entering behaviour may benefit more in learning Geometry through auto-instructional programmes, than learning it through conventional methods.

1.6 Assumptions and limitations:

The present study has been confined to "Modern Geometry"
for Std. IX. Because this subject is quite new to the pupils as well as to the teachers; "A School Mathematics Project" is introduced in a few selected schools of the city of Ahmedabad and in some schools situated in different parts of Gujarat State, on experimental basis. The project is introduced with the direct help and guidance of Vikram A. Sarabhai Community Science Centre, Ahmedabad. The Science Centre has developed a special syllabus in modern Geometry for Stds. VIII to XI of high schools. It has also developed text books for the same. The investigator has selected sixteen high schools in which the school Mathematics Project is introduced gradually and has utilised the syllabus and the text books of the project for the present study. It is assumed that all the students under the experiment possess knowledge mentioned in the pre-requisite of the programme and can understand the language of the written programmes. A teacher made achievement test is used in order to evaluate the effectiveness of the programmed learning materials and to study its relation with different variables.

1.7 The scheme of Chapterization:

Chapter II deals with the theoretical background of programmed learning: recent trends in education, contribution of prominent thinkers, meaning and definition of programmed learning, essential features of programmed learning, psychological foundation of programmed learning, types of programmes, possible advantages and disadvantages of programmed learning.
Chapter III throws light on the past studies and gives a review of the past studies and work done in the field. The investigator has given some observations on research results and position of programmed learning in different countries.

Chapter IV gives a complete account of the development of programmed learning material on the subject of modern Geometry for the pupils of Std. IX.

The Vth Chapter deals with the description of the tryout of the programmed learning on a small sample of students. It is in this chapter that the investigator has shown the steps of finalizing the programmed learning.

The experimental design of the present study is fully described in Chapter VI.

The analysis and interpretation of the data are discussed in Chapter VII which has enabled the investigator to write down the observations and conclusions in the last Chapter. The detailed account of the report is given in the chapters to follow.