**3.3 Anticipated outcomes of Teaching Natural Science – Developing Scientific Literacy**

**Scientific Literacy**

In order to develop thorough understanding among the students, a science teacher should not only have adequate understanding of science, but also be familiar with the process of science. To achieve this we should develop scientific literacy.

“Scientific Literacy” means literacy in a scientific way ie, awareness in science. It means a firm understanding of the nature of science and its inter relationship with technology and society. In other words, “Scientific literacy is the knowledge and understanding of the scientific concepts and processes required for personal decision – making, participation in civic and cultural affairs and economic productivity”. (National Academy of Sciences, 1995). It is one of the major aims of teaching science. Scientific literacy enables people to use scientific principles and participate in discussion of scientific issues that affect society.

Scientific literacy implies three major ideas or aspects:-

1. To understand one’s environment.
2. To know about the process by which understanding is gained. (Scientific enquiry)
3. To develop the spirit of science.

**Characteristics of a Person Possessing Scientific Literacy**

* A good science background knowledge of related facts concepts, theories etc. with the ability to apply them.
* A clear understanding of the ever-changing nature of science.
* A positive attitude towards science and technology.
* Ability to make value judgement and decisions on issues related to science based on societal needs.
* Ability to use scientific method to solve problems related to biological phenomena and to make decisions appropriate to day-today life.
* Sufficient process skills in science, which would enable a person to function in a better manner as a citizen.
* An appreciation of the values of science and technology and their effects in society.
* A better understanding of the world around us.

A person possessing these attributes can be considered as scientifically literate.

**Module 3.1**

**AIM and OBJECTIVE**

Generally, the terms “Aims’ and ‘Objectives’ are taken as synonymous terms, but in a deep sense both differ significantly.

AIM is a distant goal which is not immediately attained or reachable, but can be realised with the help of certain planned activities. They are the broad goals of education which may not be achieved in the classroom.

Eg:- “Self realisation” is the destination or goal towards which education tries to lead the learner. This is not a goal that could be immediately realised neither it is fully realisable, however long we try for it. In other words, it is a distant goal to which we move.

OBJECTIVE is an immediate goal that can be realised with the help of definite planned activities. In other words, it is a specific and immediate goal attainable as a result of classroom teaching. An objective defines what we are trying to accomplish by teaching. It is the terminal behaviour expected of the pupils at the conclusion of a period of learning.

Eg:- Understanding the meaning of a formula in science or the ability to apply a formula to solve a related problem.

**DIFFERENCE BETWEEN ‘AIMS’ and ‘OBJECTIVES’**

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|  | **AIM** |  | **OBJECTIVE** |
| 1 | Aim is a distant goal. | 1 | Objective is a short term goal. |
| 2 | They are directional, but broad and general. | 2 | Specific ie, clear and precisely defined. |
| 3 | Aim can be achieved by thorough long term planning. | 3 | They are the end point of the possible achievement ie, the terminal behaviour expected from the pupils at the end of a period or instruction. |
| 4 | Aims include objectives. | 4 | Objective come from aim whose attainment are the steps to the achievement of aims. |
| 5 | Aim involves all-round development of an individual and is beyond the scope of the school. | 5 | Objective are specific, immediate and change is brought in learner during an instructional hour. |
| 6 | Aim is the answer to the question of 'why' a subject is taught. | 6 | It is an answer to the question of 'what' will be achieved after the teaching of that particular topic. |
| 7 | Aims are close to the 'ideals' which cannot be fully achieved | 7 | Objectives are achievable completely. |
| 8 | School as well as society are responsible for their achievement. | 8 | The school is responsible for their fulfilment.  |
| 9 | Aims cannot be changed from subject to subject. Eg:- Self realisation  | 9 | May be changed from subject to subject. Eg :- Understanding the meaning of a formula in science. |

In short, objectives originate from aims and the attainment of each objective takes us one step forward in the achievement of aim.

**General Aims of Teaching Science**

The following aims were recommended by the All India Science Seminar which was held in Simla.

* Arousing love for Nature.
* Developing habits of observation, exploration, classification and systematic way of thinking.
* Developing powers of manipulation and creativity.
* Development of neat and orderly habits.
* Inculcation of the habit of healthful living.
* Acquisition of a fund of information concerning Nature.
* Developing ability to generalise and apply knowledge in everyday life.
* Developing hobbies.
* Inspiring children with stories of inventions and discoveries.

Besides the above mentioned aims the following aims also should be kept in mind while teaching science.

* Better understanding of the nature of science
* Development of scientific attitude.
* Development of interest and appreciation.
* Acquisition of skills.
* Training in scientific method.
* Helping the pupils adjust themselves better with the society.
* Helping the pupils develop suitable career interests.
* Preparing the children for good citizenship.