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(A-1) VALUES OF TEACHING NATURAL SCIENCE

1. Intellectual Value - *decision making, considering all*

Science is organised common sense. It has introduced us to new ways of thinking and reasoning. It has its own disciplines. It teaches people to sharpen their intellect and makes them more careful and systematic in their reasoning. It provides a unique training in truth, include a spirit of enquiry, the capacity to know the unknown and the strength to face hardships and failures. The pursuit of science requires diligence and patience. A true scientist has a high regard for truth. His judgments are above prejudice and rest on facts alone. Persons other than scientists find it too hard to have the calm detachment and unemotional judgments of men of science.

It trains the minds of the people, creates very good habits and develops increasing awareness about themselves, about fellow creatures and about the material universe we live in. Obviously it helps to understand, evaluate and solve numerous social problems of life. Thus, the individual begins to reason things he meets in daily life and discharges his duties in a better manner and leads a happy, successful and satisfying life.

2. Practical Value - *provements of tech, medicine, hobbies, games*

We are living in an age of science and everything around us concerns science. Some knowledge of the present position and progress of science is, therefore, necessary for an adequate understanding of the world around us. We are becoming more and more dependent on scientific discoveries and their daily applications. So much depends upon electricity that life will be hell without it. The stock-broker of Delhi knows what happened in Bombay a minute or two ago and can fix his prices accordingly. One can converse by wireless telephone with a passenger on a liner in mid-sea or speak to a friend sitting in the remotest corner of the world. Science has revolutionized means of transport the aeroplane has brought different countries much closer together. In other words, the science has shortened the world. It has enabled men to fly like birds. The motor car, the bus, the train, etc. have made the transport very comfortable and enjoyable.

Science has a great medicinal value and has worked miracles in the fields of surgery and medicine. Every year shows new drugs and new

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applications of physical and biological sciences for curing diseases, prolonging life and preserving health. It has thus, reduced the miseries of humanity and enabled people to live longer and happier.

Leisure is no longer a problem. Science has enabled people to use their leisure to the best advantage. A number of science studies at school can form the basis of useful hobbies in a later life. 'Gardening' cannot be fully enjoyed, appreciated and benefited from unless the gardener knows something of plant-breeding, soil-physics, chemistry and scientific manuring etc. Similarly, photography requires some knowledge of the optics, chemistry of developing etc.

A knowledge of the facts and principles of science and their applications will result in better understanding of the world and a more national mode of life. Such knowledge is useful to the individuals and the community as a whole.

3. Cultural Value

Science has a cultural value because it now forms an essential part of our social heritage. It has a literature of its own which is no less appealing than that of more humanistic studies. It has a romance of its own. The history of scientific discoveries, the adventures of the scientists, their mode of living, their spirit of sacrifice etc. places science in the first rank of humanistic studies. A knowledge imparted by the study of different branches of science develops in us a logical mind, a critical judgement and a capacity for scientific organization. It produces in us that breadth of imagination which is essential for a proper solution of the problems of life. From these things we have evolved this civilization and culture. Incidentally it places on us a great responsibility of saving this culture and civilization. Thus, atomic energy should be used for constructive and not for destructive purposes.

4. Vocational value

Science forms the basis of many of the studies of a purely vocational nature and thus prepares pupils for various professions-like medicine, engineering, agriculture etc.

Thus, it is quite clear that a subject which is so closely associated with our daily life and the world which surrounds us and is so useful to an individual as well as to community as a whole cannot be neglected from the school curriculum. In an age of science, any education intended to prepare us for a complete and purposeful living will be defeating its purpose if it takes no account of the need of the hour and the climate of the day which is permeated with the ideas and the hopes of the scientists.

5. Moral Value

truth

Science develops morality by teaching truthfulness and reasoning. Every scientist is a seeker of truth. Although, in the modern materialistic world, truth may always succeed. A business man earns millions by false ways and means, a successful politician may not draw the real picture of things to attract followers, a lawyer may flourish only by lying. But that does not mean that training in truthfulness is bad. Actually a scientist or a student of science aims at a different type of success.

A popular anecdote from the life of Mr. Huxley may be worth mentioning here. Once a priest and friend of Mr. Huxley was discussing with him the topic of the existence of God. He gave a number of religious arguments, which were not convincing or reasonable. Mr. Huxley then humorously remarked, "Show me the existence of God by the test tube method."

So these arguments weigh down to the view that everything must be tested on the touch stone of reason and truthfulness, which are perfectly developed by the learning of science.

6. Aesthetic Value

Every man of science has a passion for truth. But according to a well-known English poet, Keats, "Truth is Beauty." In nature, everything we find is beautiful and the discovery of the mysteries of nature is the concern of science.

Every scientist relishes the aesthetic aspect of his discoveries and inventions. He feels an intrinsic charm in unfolding the pleasure of nature and natural phenomenon. He manifests his aesthetic impulse when he undertakes a probe for universal laws and comprehensive theories.

Moreover, science is an art. Every man of science is an artist. Actually there is no fundamental difference between art and science. An artist aims more deliberately at beauty while a scientist ultimately comes to beauty through reasoning and truthfulness.

7. Psychological Value

The entire teaching and learning process of science is based on fundamental principles of psychology. The principles of 'learning by doing,' activity method, 'learning by observing' concrete and living specimens, are the primary things in psychology. Moreover, science satisfies the primary things in psychology. Moreover, science satisfies common instincts as creativeness, self-assertion, curiosity etc.

8. Value of Scientific Method

The knowledge of science inculcates among the pupils a specific procedure for attacking a problem. The 'specific procedure' is known as 'sci-

scientific method?

A scientific method involves the following steps :

- (i) The problem is stated.
- (ii) Observations relevant to the problem are collected.
- (iii) Hypothesis consistent with the observations is formulated.
- (iv) Predictions of other observable phenomena are deduced from the hypothesis.
- (v) Occurrence or non-occurrence of the Predicted phenomena is observed.
- (vi) The hypothesis is accepted, modified or rejected in accordance with the degree of fulfilment of the prediction.

This training in scientific method which a pupil receives by the study of science, can be transferred to solve other problems of life.

9. Value of Scientific attitude

Every activity or subject has got its own specific disciplines to include among the pupils. The teaching of science has peculiar disciplines, popularly known as scientific attitude, to develop among the learners. These attitudes or disciplines include open-mindedness, keen observation, critical thinking, suspended judgements, free from bias or superstition.

Scientific attitude can be defined as –

Open-mindedness, a desire for accurate knowledge, confidence in procedures for seeking knowledge and the expectation that the solution of the problem will come through the use of verified knowledge.

Such qualities once developed will prove very beneficial in the later life of the pupil.