

Science Education at different levels and Issues and challenges in teaching Science

Education of science is categorised in different form for different levels. For different levels, the strategies, issues and challenges are different. Here I am identifying some of important issues and challenges at different levels.

Science Education at Primary Education Level:

At the Primary level Science & Social Science are integrated as Environmental Studies.

At this stage Science education should help to:

- Énurture the curiosity of the child about the world (natural environment, artefacts and people)
- Éhave the child engage in exploratory and hands-on activities for acquiring the basic cognitive and psychomotor skills through observation, classification, inference, etc;
- Éemphasise design and fabrication, estimation and measurement
- Édevelop basic language skills: speaking, reading and writing not only for science but also through science.

Science Education at Upper Primary Education Level:

At this stage-

- ÉThe child should be engaged in learning the principles of science through familiar experiences, working with hands to design simple technological units and models (e.g. designing and making a working model of a windmill to lift weights)
- Écontinue to learn more about the environment and health, including reproductive and sexual health, through activities and surveys.
- ÉScientific concepts are to be arrived at mainly from activities and experiments.
- ÉGroup activities, discussions with peers and teachers, surveys, organisation of data and their display through exhibitions, etc. in schools and the neighbourhood should be important components of pedagogy.

Science Education at Secondary Education level:

At the secondary stage, students should be engaged in:

- Élearning science as a composite discipline,
- ÉIn working with hands and tools to design more advanced technological modules than at the upper primary stage,



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É In activities and analyses on issues concerning the environment and health, including reproductive and sexual health.

É Systematic experimentation as a tool to discover/verify theoretical principles,

É Working on locally significant projects involving science and technology, are to be important parts of the curriculum at this stage.

Science Education at Higher Secondary School level:

At the higher secondary stage:

É Science should be introduced as separate disciplines,

É With emphasis on experiments/technology and problem solving.

Issues and challenges in teaching Science:

Position Paper of National Focus Group on Science identifies some issues with refer teaching of Science:

É Lack of infrastructure: resource rooms, activity rooms, laboratories, material for models, toys, tools, appropriate books for reference, encyclopaedias, dictionaries, multimedia and internet facility.

É Overloaded syllabus: The most important consideration while developing a science curriculum is to ensure a reduced emphasis on mere information and provide greater exposure to what it means to practice science.

É Inadequacy of textbooks based on constructivist methods.

É Instrument of social change: Need to use science curriculum as an instrument of social change to reduce the divide related to economic class, gender, caste, religion and region.

É Present day science education develops competence but does not encourage inventiveness and creativity.