Objectives of Teaching Biology

Introduction

The objectives imply the changes we try, to produce in a child through education. Education is a tripolar process. The educational objectives determine the learning experiences, which bring about a change in the behavior of the learner. The learning experiences are provided by the teaching activities to achieve the educational objectives The change of behavior of the learner is evaluated by educational objectives. The objectives of teaching science are mainly directed to achieve the broader goals of education. The aims and objectives of education are based on the philosophy of life and the needs of the society. The aims and objectives are always subject to change in the changing scenario of the modern world. They are undergoing many changes as the goals and the needs of the ety are also changing with the modern times. There are a number of pressures being exerted by the society to bring a conceptual change in the methods of teaching science Today Science is not taught as a theoretical subject or as a research discipline but as a medium, which helps in developing the complete potentialities of the learner and in making him a ful and efficient citizen of the modern society. More stress is given to the practical aspects of science teaching. The knowledge skills, ethics, and values are gives more prominence the curriculum today. The teaching of science should prepare individual to face the challenges of this modern technological in The science education aims at making the individual critical thinking and logical reasoning.

In this scenario of continuous change the subject of science can justify its importance only when it aids in modifying the ways of thinking of the student, their approach towards life, the

values they inculcate and the scientific attitudes they develop. For achieving all the above ideals, the objectives of the science education have to be continuously modified based on the needs and requirements of the society.

What are Aims and Objectives of Education?

All activities have a purpose. A purposeless activity is ineffective. Purpose of the activity is nothing but a goal or an aim or an objective. For effectively achieving a goal, we need to clearly identify the purpose of the activity plan the experiences and evaluate the success. Only when we have clear goals can we compare the success of our endeavor in achieving the planned activity. Every science teacher has to know about the aims and objectives of teaching science. This will help her to be more systematic and effective in her teaching. This will help the teacher to frame the curriculum, identify the teaching methodology, observe the learning experiences and evaluate the learning outcomes.

Aims of Teaching Science

Aims are ideals, or long-term goals. They are the high expectations that we like to realize as learning outcomes of imparting the knowledge of the science. Their realization may or may not be possible to the expected extent. Aims are broad ideals which direct the teaching programme. Aims are indefinite. They are vague. They take a long time for achievement. The National Policy on Education (1986) says "Science education will be strengthened so as to develop in the child well defined abilities and values such as the spirit of enquiry, creativity, objectivity, the courage to question, and an aesthetic sensibility." Redden explains the aims of education to be achieved through formal schooling as – "Education is the deliberate and systematic influence exerted by the mature person upon the immature through instruction, discipline and harmonious

development of physical, intellectual, aesthetic, social and spiritual powers of human being according to individual and social need directed towards the union of the educand and his creator as the final end."

What is an Objective?

The aims of education, which can be achieved in a school, are called as ***objectives.*** An objective is a part of an aim. It indicates an end point of possible achievement. Objectives are immediate attainable goals. They vary from subject to subject and they are specific, precise and clearly defined and become meaningful to the students and teachers in a teaching-learning situation. Objectives make a teaching programme meaningful. They indicate the behavioural changes in the pupil after completion of instruction. It is the expected terminal behavior or learning outcome of the pupil at the end of teaching-learning process.

The terms aims' and objectives' are usually taken as snonymous terms in education. Aims are ideals whose realization may or may not be possible to the expected levels. . They need long term planning. Objectives are a means of achieving these aims and in a definite way. The aims of teaching science can be broken down into smaller objectives, which may be helpful in providing the learning experiences and bringing desirable changes in the individuals.

Differences between Aims and Objectives

Sl. No.	Aims	Objectives
1	Aim is an answer to the question of why a topic is taught	Objective answers what will be achieved after the topic is taught.
2	Aims are long-term goals They are close to the ideals to be realized	They are short-term goals to be achieved through class instruction.
3	They give a direction to the education	They are a step in reaching the direction.
4	They are vague and indefinite in nature.	They are definite and specific in nature.

5	The school, and society are responsible for their fulfillment.	The teacher is responsible for their fulfillment.

The objectives of the science teaching are formulated on philosophical, sociological and psychological bases. The mam considerations for formulating them are:

I. **The capabilities of the learners:** The needs and the abilities of the learners are important when we frame the objectives. The psychological principles need to be taken into consideration.

II. **The requirements of the society:** The influence of science and technology on the society and its improvement may be considered.

III. **The nature of the content:** The content and the subject matter should not be too simple or too complex and abstract. It should be able to develop the scientific values in the learner.

IV. **The aims of the educational system:** The objectives should be able to achieve the aims of education.

V. **Constraints in implementation:** The objectives should not be difficult in implementation. They could be achieved in a classroom.

The objectives thus formulated should be appropriate for the age and ability of the learners, they should incorporate the practical experiences and they should suit the modem needs

Criteria for Selecting the Objectives

I. Specific: A good objective should not be vague. It should be specific

II. **Unambiguous:** A good objective should not be ambiguous.

III. It should be clear in specifying the required outcomes.

IV. **Appropriate:** The objectives should provide appropriate learning in tune with the age and maturity of the learner.

V. **Practicable**: The objectives should provide practical experiences in learning.

VI. **Feasibility:** Objectives should be easy to be achieved in the classroom.

Main Objectives of Teaching Biology

I. Providing practical knowledge of the content.

II. Providing advanced information.

III. Developing skills, knowledge, interests, and appreciation, application and understanding through the teaching of life science.

IV. Stimulating the spirit of investigation and invention.

V. Improving the power of observation and experimentation.

VI. Developing the problem-solving capacities.

VII. Understand the utility of biological science to the modern life.

VIII. Inculcating the ideals like truthfulness, open-mindedness and reflective thinking in the learner.

Recommendations of Various Commissions on Science Education

To develop science as a core subject in education mainly in schools and at a later level in colleges, the government of India after independence appointed a number of commissions to work out the syllabus, infrastructure, evaluation procedures, teaching study material, and qualified staff, and other allied problems in recommend suggestions. A number of eminent educationists worked on these problems and their recommendations led to the development of science curricula and

establishment of science as core subject at various levels of education. Some important commissions and their recommendations have been elucidated:

University Education Commission or Dr. Radhakrishnan Commission (1949)

This commission was constituted after independence to study the feasibility of starting science as a core subject in schools. It recommended the following:

- Improvement of libraries and laboratories.
- Against any narrow specialization in sciences.
- Curriculum should be relevant to the physical and social environment of the student
- Curriculum should include sciences, and language at secondary level.
- The three-year degree course should have two optionals as science and developing science education:
- Mathematics.
- Admissions to postgraduation should be on merit basis at postgraduation level.

The Secondary Education Commission or Dr. Mudaliar Commission

'One of the most important commissions, which recommended:

To retain General Science as a core subject in the school curriculum –a significant milestone in the history of science education in India Teaching of General Science as a compulsory subject in higher and secondary schools. Envisaged teaching of specialized sciences at advanced levels by competent and qualified teachers. All India Seminar On Teaching Of Science {1956}: Held at Taradevi in Simla hills in 1956. Its main function was to: Evaluate the draft syllabus of Physics, Chemistry and Biology.

To examine Elementary Science syllabus at primary and middle school stage.

To consider various other aspects of teaching such as equipment, apparatus, methods of examinations, teaching aids in science and other allied topics like textbooks, science clubs, museum etc.,

9.3.3 Indian Parliamentary And Scientific Committee (1961)

This committee was set up under the chairmanship of Shri Lal Bahadur Shastri. This committee took up the study of science in schools. It included:

- Increase in the school going children.
- Shortage of qualified teaching staff.
- Need for technically trained manpower.
- Need for changing the process and aims of science.
- Study the structure of school system and the required content of the subject.
- Bridging the gap between what is taught and what should be taught at various levels.

Indian Education Commission or Kothari Commission(1964-66)

An important commission on promoting education particularly science education, it suggested:

- Upgrading school curricula by research in curriculum development, revision of textbooks and teaching learning material.
- Science and Mathematics should be taught on a compulsory basis to all pupils.
- Emphasis should be on acquisition of knowledge and ability to think logically, to draw conclusions and make decisions at higher levels.
- Science teaching should be linked to agriculture and technology.

- At lower secondary level experimental approach to the learning of science should be stressed.
- The methods of science should be modernized. Investigatory approach and laboratory work should be stressed.
- Curriculum should cater to the special needs of gifted pupils.
- Development of science must derive nourishment from our spiritual and cultural heritage.

Ishwarbhai Patel Committee (1977)

It was appointed to review the curivculum of ten-year school. The terms of reference are:

- To scrutinize NCERT syllabus and textbooks.
- To review the scheme of studies and the time allocated for various subjects.
- To ensure that teacher has adequate time for experimentation, creative work, and remedial instruction.
- To accommodate the needs of bright children for advanced level courses.

Today science is regarded with due admiration and respect. The curricula and textbooks are upgraded and new innovations have been included. Science has been given a practical orientation. National Science Talent Search Examinations are conducted to pick up talented students. Application of science to life and correlation of sciences are stressed in the school curricula. In this scenario of advancement of science and technology, the teacher plays an important role as a facilitator of scientific knowledge.

9.4 National Policy on Education 1986

Almost 18 years after the introduction of 1968 policy, a new education policy was developed in 1986. It was felt that our delivery system is not able to meet the needs and aspirations ol the people. The National Policy on Education 1986 reaffirmed the decision of the 1968 policy that science and mathematics hold remain ass compulsory subjects in the first ten years ol howl education It must be strengthened because all the areas of development and technology based and for that we

need experts, middle-order workers and scientifically literate citizens.

Regarding science education, the Policy stipulates

- Science and mathematics will remain as core subjects in the first ten years of school education.
- In order to develop scientific temper and to attain other goals, it is necessary to define the objectives to be fulfilled through science education.
- Involvement of community, non-government and voluntary agencies is required to pool the resources by establishing networks among different institutions. Efforts should be made to generate manpower at the grassroot level that will spearhead the implementation of ideas stated in NPE.
- Special programmes are needed for the educationally backward states and educationally backward schools of the society. This is necessary for the removal of disparities, attainment of women's equality and education of scheduled castes and scheduled tribes and other educationally backward sections and areas.

- For universal enrolment and retention, improvement in the quality of education is necessary. Each student learns in a different way and each student has the right to learn. The teaching/learning of science should be designed in such a way that it serves that basic right. Science education at the elementary level will be so designed that instead of loading the child with content information, it should provide him with the joy of learning.
- Science education will be extended to the vast numbers Who have remained outside the pale of formal education. This is to be kept in mind while planning science education for non-formal system.
- Science and mathematics curriculum will be designed for the secondary level for conscious internalization of healthy work ethos. This will provide valuable manpower for economic growth as well as for ideal citizenship to live effectively in the science/technology-based society.
- Science curriculum for general education will be implemented in the pace-setting schools with sufficient scope for innovation and experimentation.
- Science up to Class X should be treated as one. The laws and principles of science, which are operating in the environment, should be used for creating desired teaching/ learning situations.The performance of activities will be given top priority in teaching/learning of science

Types of Objectives

The objectives can be classified into two major categories. They are:

I. Educational objectives

II. Instructional or teaching or learning objectives.

Educational Objectives

An educational objective is a desirable change that is brought about in the behavior of the students through the teaching learning process. Educational objectives are based on the aims of education. These are in turn related to the philosophy of the nation. The objectives of education should specify the observable and measurable changes. The objectives of education are in consonance with the values of education. They provide a basic platform for the development of the educational system.

The educational objectives are general statements, which imply changes we try to produce in the child. Educational objectives are not the only goal towards which curriculum is shaped and instruction is guided. It should also provide a detailed specification for construction and use of evaluation techniques

The educational objectives indicate the change that is brought in the child by the education. The educational objectives are broad ideals that are related to the educational system. They are general statements based on the philosophy of education. The educational objectives are achieved by the learning experiences provided by the teacher. The teaching learning activities provide experiences and the change of behavior is evaluated in terms of

these objectives. Thus educational objectives are the basis for teaching activities and evaluation techniques.

The whole education system is directed towards achieving the aims and objectives of education which lead to an all round development of the learner. It is not possible to realize all the

aims of education in a school, as they include a total programme of education and out-of-the school experiences also. The school programme forms only a part of total educational programme.

Bloom defines educational objectives, as "the educational objectives are not only goals towards which the curriculum is shaped and towards which the instruction is guided but they are also the goals which provide the detailed specification of the construction and use of the evaluative technique.

The hierarchy of the objectives can be understood as

Aims of Education

Objectives of Education

Instructional Objectives

Instructional Objectives

The expected behavioral changes that are to be brought through the classroom instruction are termed as instructional objectives. The teaching objectives are specific instructional objectives, which bring about immediate behavioural changes in the learner as a result of classroom instruction. Instructional objectives are those statements, which express specific and measurable terms the skills and attitudes, which the students develop as a result of following a particular method of instruction. The instructional objectives provide guidance and direction to the method of teaching. Instructional objectives are related to learning outcomes of the learner.

The teaching objectives are framed by the teacher and are achieved in a short duration of around 40 minutes. The teaching objectives are specific and are purely concerned with the

classroom teaching. They are based on the psychological principles. The teaching objectives are identified based on the content analysis. They are determined during the lesson planning.

Comparison of the Educational and Instructional Objectives

Sl. No.	Educational Objectives	Instructional Objectives
1	They' are broad ideals, which are based on aims of education.	They are specific objectives derived from educational objectives.
2	Based on the principles of educational philosophy	Based on principles of psychology
3	They require a longer duration for achievement	They are short-term goals. Can be achieved at the end of classroom instruction.
4	Educational objectives cover the entire process of education	Cover individual subjects seperately
5	They include the teaching objectives	They are part of the educational objectives
6	Eg. Development of scientific attitudes, feelings of national integration etc.,	Eg. Developing knowledge, skills, and understanding of concepts.

Blooms Taxonomy of Educational Objectives and its Limitations

The word taxonomy means classification. It is the classification of ideas and objectives. Taxonomy of educational objectives means an analysis of instructional objectives in terms of the learning outcomes resulting from appropriate teaching learning situations. The classification of educational objectives assumes that the modification of the behaviour of the learner is the result of the learning experiences generated by the teaching learning process. Taxonomy means a

categorization of an object. I hus taxonomy of instructional objectives implies categorization f instructional objectives. It means an analysis of instructional bjcctives in terms of the precise and specific teaching outcome. The taxonomy, of educational and instructional objectives has worked out on the assumption that the teaching –learning ocess may be conceived as an attempt to change the behaviour the pupils with respect to some subject matter. Behaviour of the divided into three domains-Cognitive (knowing), reflective (feeling) and Psychomotor (doing). They are related to id, heart and hand. The taxonomy of educational and rctional objectives have also been considered to belong to three domains. The behavior modification of the learner is divided into domains.

- Cognitive domain
- Affective domain
- Psychomotor domain

Taxonomy of the educational objectives is useful as

- Objective tool of an evaluation
- Helps in proper coverage of all aspects learners' growth.
- Helps in the meaningful understanding of various dimensions of learner's development.
- Helps in identifying and grading the teaching learning situations, which can be an important source for selecting proper evaluation tools.
- It acts as a link for communication between teachers, evaluators, research workers, psychologists and behavioural scientists.
- Opens new avenues for research in the field of education.

- In 1948, the convention of American Psychological Association considered classifying educational goals for evaluating the performance of students. The educational objectives provide the basis for building the curricula and tests for the measuring the understanding of those curricula by the students. These educational objectives have been classified into three major domains based on the behaviour modification they bring in the learner. This classification of objectives is called as the "Taxonomy of Educational Objectives".

The advantages of the Taxonomy of Educational Objectives are:

- It helps in clarifying the doubts pertaining to the objectives of education.
- It acts as a convenient system for describing and ordering test items, examination techniques and evaluation procedures.
- The taxonomy of educational objectives would help in comparing the various educational programmes.
- It would provide an order for the educational objectives.

In the year 1965 Benjamin Bloom – A professor, University of Chicago along with a few others published a book on "Taxonomy of Educational Objectives". The book influenced every aspect of formal education; from the way the curriculum designed to the way performances of the students were evaluated at class level. As a follow up they also published two handbooks - one on the cognitive domain and other on the affective domain.

According to them most of the educational objectives could be placed in one of the three major domains of classification - cognitive, affective and psychomotor.

The cognitive domain includes those objectives that deal with recall or recognition of knowledge and development of the intellectual abilities and skills.

The objectives of affective domain describe "changes in interest, attitudes, and values and the development of appreciations and adequate adjustment".

The psychomotor domain pertains to " the manipulative or motor skill area".

Cognitive Domain

The largest proportion of educational objectives falls in this domain. Bloom has divided this domain into six major classes. They are --

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

The classes are arranged hierarchically as objectives of higher classes typically build on behaviours found in lower lasses. Most of the teachers and learners consider that acquisition f knowledge is the primary if not the sole aim of education. If a tudent is able to recall or recognize the idea or phenomena countered in learning, he satisfies the requirements of first level f this domain. But true knowledge involves relating and judging, anizing and reorganizing. It requires a higher degree of mitive capability. These enhanced capacities are realized in higher classes of mitive domain. Although information or knowledge are ognized as an important outcome of education, very few teachers regard this as primary or sole outcome of instruction. What is needed is that the

students can do something with their knowledge so that they can apply the information to new situations and problems.

Affective Domain

These objectives emphasize a feeling of tone, an emotion, or a degree of acceptance or rejection. Affective objectives vary from simple attention to selected phenomena to complex but consistent qualities of character and conscience. Objectives like intrest, attitudes, appreciation, values and emotional sets are included here. There is a broad relation between the objectives of cognitive domain and affective domain. Once the objectives of cognitive domain are developed, the development of the affective domain objectives follows. This suggests that the affective behaviours develop when appropriate learning experiences are provided for students much the same as cognitive behaviors develop from appropriate learning experiences. The objectives of the affective domain are structured hierarchically. A learner perceives a phenomenon, attends to that phenomenon, responds with positive feeling, places value upon it, organizes the value within valuation system, and finally characterizes the value complex within his/her entire outlook of life. This domain includes

- Receiving
- Responding
- Valuing
- Organizing
- Characterizing

Psychomotor Domain

The major organizational principle is that of complexity with attention to the sequences involved during the performance of a motor act. With the psychomotor learning the learner should be able to perform physical or motor skills as a result of education or training programme. This domain comprises

- Imitation
- Manipulation
- Precision
- Articulation
- Naturalization

CLASSIFICATION OF EDUCATIONAL OBJECTIVES

Bloom and his associates have developed the most portant classification of objectives of cognitive domain in the 1956. The affective domain objectives by Krath wohl, Bloom "' l Masia in 1964, and psychomotor domain objectives by simpson in 1969

Taxonomy of Educational Objectives of Cognitive domain

Knowledge

Knowledge is defined as the remembering of previously nd material. It stresses the process of remembering. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain.

Knowledge is the recall of specifics, methods and processes, recall of a pattern, structure or settings. It includes:

Knowledge of terminology

Knowledge of facts

Knowledge of conventions

Knowledge of trends and sequences

Knowledge of classifications and categories

Knowledge of methodology

Knowledge of universals and abstractions

Knowledge of principles and generalizations and

Knowledge of theories and structures

Verbs Related to Knowledge

Defines; describes; enumerates; identifies; labels; lists; matches; names; reads; records;

Comprehension

Comprehension is defined as the ability to grasp the meaning of material. Translating material from one another, by interpreting material, and by estimating future may show this. These learning outcomes go one step beyond simple remembering of material, and represent the lowest level understanding.

Comprehension includes:

• Translation

• Interpretation

• Extrapolation

Application

Application is the ability to use learned material in the new situations. **It** involves the ability to apply the knowledge of concepts gained **in** the classroom to new situations outside. It requires the higher levels of understanding than those of the comprehension

Verbs Related to Application

Acts; administers; articulates; assesses; charts; collects; computes; constructs; contributes; controls; determines; develops; discovers; establishes; extends; implements; includes; informs; instructs; participates; predicts; prepares; preserves; produces; provides; relates; reports; shows; transfers; uses; utilizes.

Analysis

Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of parts, analysis the relationship between • parts, and recognition of the organizational principles involved. Learning outcomes here present a higher intellectual level than comprehension and application because they require an understanding of both the tent and the structural form of the material.

It includes the breakdown of a communication into its tituent elements or parts so that the ideas and concepts remain Involves the

- Analysis of elements
- Analysis of relationships

- Analysis of organizational principles

Words related to Analysis

Breaks down; correlates; diagrams; differentiates; ruminates; distinguishes; focuses; illustrates; infers; limits; lines, points out; prioritizes; recognizes; separates; subdivides

Synthesis

A plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviours, with major emphasis on the formulation of new patterns or structure. Synthesis includes putting together elements and parts into a new whole. It involves

- Developing unique communication
- Developing a new set of operations
- Arriving at a new set of abstract relations

Verbs Related to Synthesis

Adapts; anticipates; categorizes; collaborates; combines; communicates; compares; compiles; composes; contrasts; creates; designs; devises; expresses; facilitates; formulates; generates; incorporates; individualizes; initiates; integrates; intervenes; models; modifies; negotiates; plans; progresses; rearranges; reconstructs; reinforces; reorganizes; revises; structures; substitutes; validates

Evaluation

Evaluation is concerned with the ability to judge the value of material for a given purpose. The judgments are to be based on definite criteria. These may be internal criteria

(organization) or external criteria (relevance to the purpose) and the student may determine the criteria or be given to them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all the other categories, plus conscious value judgments based on clearly defined criteria. Evaluation judges the values of the materials and methods for the given objectives. They are

- Judging the evidences internally
- Judging the criteria externally

Verbs Related to Evaluation

Appraises; compares & contrasts; concludes; criticizes; critiques; decides; defends; interprets; judges; justifies; reframes; supports.

Objective	**Ability**	**Associated verbs**
I. Knowledge	Recall Recoznize	Define, state, list, Recognize name, write, recall label, underline, select, reproduce, measure.
2 Comprehension	Sees relationships cites examples Discriminate verify generalize	Identify, justify, classify, judge, justify
3. Application	Give reason, Formulate Hypothesis, Establish relation, Give inference	Predict, assess, choose, demonstrate, construct, show, compute
4. Analysis	Analyze	Identify, conclude, differentiate, separate, compare, contrast, break down, resolve, criticize
5. Synthesis	Synthesize	Combine, summarize, organize, derive, relate, conclude, generalize
6. Evaluation	Evaluate	Determine, defend, criticize, evaluate.

Limitations of Bloom's Taxonomy

Blooms taxonomy has been criticized for its total commitment to the behavioral objectives. It is difficult to convert the theoretical concepts into behavioral objectives. The behaviour

specification of the objectives may not enhance student learning as specified by Bloom. They may also reduce the learner's individuality. Bloom's classification is not applicable to all areas of the curriculum. This classification lays emphasis more on measurable behavior and does not give importance to work of the pupils.

Writing Instructional Objectives and Specifications

Instructional Objectives form the core of an instructional procedure. The instructional objectives are developed and set before an instruction is planned and delivered. These objectives help in identifying the expected behavioral outcomes of the learners through that particular instruction. The instructional objectives are the terminal results of the learning stated in terms of changes observed in the learner's behaviour. The instructional objectives are developed based on the following factors:

- The age and the maturity of the learner
- The physiological and psychological parameters
- The previous learning experiences
- The availability of resources for imparting education.

Important character of instructional objectives:

Instructional objectives are the statements of students terminal behavior – the change in their behaviour which is a result of learning

- Instructional objectives indicate the outcomes of teaching learning process.

- Instructional objectives are the skills that are imparted to the learner through the content.
- Instructional objectives indicate the end result of learning.

Specifications

These are specific learning outcomes of teaching learning process. They denote the learning outcome of the pupils and indicate how far an objective is achieved **in** a classroom situation. Specific learning outcomes are the observable, measurable behaviour changes in the learner and help in better communication between the teacher and the learner. Specifications are an important tool in lesson planning. Specifications are required to develop course material, teaching strategy and evaluate the learning outcomes.

Important characters of specifications

- Specifications are precise and unambiguous statements. Specifications are observable and measurable and are stated
- in terms of their action verbs
- Specifications refer to only one instructional objective at a time.
- Specifications are simple and feasible learning outcomes,
- which are attainable in a stipulated time and class allotted in a school.

Writing Learning Objectives in Behavioral Terms

Need of writing objectives in behavioral terms

Writing the statement of instructional objectives in behavioral terms or performance terms is called as writing objectives in behavioral terms. Taxonomic categories of objectives do not specify the form of teaching and learning activities. Behavioral objectives indicate learning activities in a classroom situation. In the present scenario there is utmost need to write objectives in behavioral terms. The teacher has to decide --

- What the child should be able to do in the classroom after the learning activity?
- What are the conditions required for developing this behavioral change?
- What will be the expected level of performance?
- For answering the above questions the teacher has to write down the instructional objectives in behavioral terms. Hence the need for writing these objectives is:
- Teaching activities are determined and delimited.
- Teaching and learning process may be integrated for effective learning outcomes
- Selecting teaching strategies for effective learning.
- To make teaching and testing objective-centered.

Guidelines for writing the behavioral objectives

- The entry level of the learner should be known.
- The topic, the content and the learning experiences should be considered.
- The teaching learning objectives should be followed

- Appropriate mental processes and abilities should be considered for writing the behavioral objectives

Advantages of behavioral objectives

- Specify the objectives
- Select the items for the test
- Integrate the learning experiences with changes in the behavior
- Designing the teaching strategies and the teaching aids

Instructional Objectives arid Specifications for Teaching Biological Science

Objective Knowledge: The pupil acquires the knowledge of biological terms, concepts, facts, processes etc.,

Specifications:

- The pupil recalls – the terms, concepts, facts and processes.
- Recognizes – the terms, facts, concepts, processes etc.,

Objective Understanding: The pupil understands the biological terms, concepts, facts, and processes

Specifications:

- The pupil translates the data
- Illustrates with examples
- Identifies the relationships of various concepts and processes
- Compares the concepts and processes

- Classifies the groups

  Distinguishes between different closely related processes

- Explains the concepts and

  Interprets the biological data, concepts', processes, floral diagrams and formulae, charts and models..

Objective Application: The pupil applies the knowledge of biology to new and real life situations .

Specifications:

- The pupil- analyses the problem
- Predicts the hypothesis
- Suggests possible methods
- Gives reasons for various phenomena
- Establishes the cause and effects,
- Draws inferences for biological problems

Objective skills: The pupil develops skills like drawing, manipulating, collecting and preserving, dissecting, observing and reporting skills

Specifications:

- The pupil develops skill of drawing: The pupil Draws neat and well labeled diagrams Draws with a sense of proportion
- Draws accurately and appropriately

Specification:

- The pupil develops the skill of manipulation: The pupil
- Handles the apparatus carefully Arranges them systematically Observes the readings precisely Develops improvised apparatus

Specification:

- The pupil develops the skill of preserving the specimens. The pupil
- Identifies the particular specimen
- Collects the specimen carefully
- Mounts the specimen using relevant procedures
- Preserves the specimen following the appropriate technique.

Specification:

- The pupil develops the skill of dissecting: The pupil
- Selects the material for dissection Fixes the specimen appropriately Handles the instruments with precision Dissects carefully
- Displays the relevant parts

Specification:

- The pupil develops skill of observation: The pupil Distinguishes between the different parts of tho specimen.
- Identifies various parts of the specimen. Notices the relevant parts carefully. Reads an instrument accurately.

- Detects errors in the experimental setup

Specification:

- The pupil develops the skill of reporting:
- Uses appropriate biological terms in describing the spec1mens
- Organizes the thoughts systematically
- Puts forth the opinions in a clear perspective.

Objective Interest: The pupil develops interest in the study of plants and animals.

Specification:

- The pupil develops interest' in
- Collecting and preserving plant and animal specimens
- Observing natural phenomena
- Reading books, magazines and journals on biology
- Visiting places of nature like forests, zoos, botanical gardens and museums.
- Participating in biological science activities in school

Objective Scientific Attitude: The pupil develops scientific attitudes

Specification:

- The pupil develops
- Curiosity to know the biological concepts
- Honesty of expression Appropriate reasoning Critical thinking Unbiased judjement

Objective appreciation: The pupil develops appreciation of nature and its utility to the human beings.

Specification:

The pupil appreciates the knowledge of biology, the role played by biology in human improvement and realizes the significance of the study of biology. The pupil appreciates the Wonderful nature Importance of plants and animals

Need for microorganisms and their use in our daily life Utility of biology to human beings Ecological balance The role of biology in enhancing the welfare of mankind.