



“बेटी बचाओ, बेटी पढ़ाओ”

JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

(Format for Preparing E Notes)

Faculty of FEM

Faculty Name- JV'n Dr. Priya Gothwal (Associate Professor)

Program- B.Sc. B.Ed-V sem / 2023-2024

Course Name - Pedagogy of Physical Science

Session No. & Name – 1.3/ Nature of Science (Unit-I)

Academic Day starts with –

- Greeting with saying ‘**Namaste**’ by joining Hands together following by 2-3 Minutes Happy session, Celebrating birthday of any student of respective class and **National Anthem**.

Lecture Starts with-

Review of previous Session-

- Topic to be discussed today- Today We will discuss about –

Topic: Development of Scientific knowledge: observation, experimentation and classification:

- Lesson deliverance (ICT, Diagrams & Live Example)-
 - PPT (10 Slides)
 - Diagrams

- University Library Reference-

Journal

- Online Reference if Any

- Suggestions to secure good marks to answer in exam-
 - Explain answer with key point answers
- Questions to check understanding level of students-
- Small Discussion About Next Topic-
- Academic Day ends with-
National song 'Vande sMataram'

Topic: Development of scientific knowledge: observation, experimentation and classification:

Introduction:

- The development of scientific knowledge relies heavily on the process of observation, experimentation, and classification.
- Observing natural phenomena helps identify patterns and form hypotheses, which are then tested through controlled experiments.
- This rigorous process enables scientists to classify and organize information, leading to the formulation of theories and laws that contribute to the advancement of various scientific fields.

Topic: Development of scientific knowledge-

- The development of scientific knowledge is a dynamic process driven by the accumulation of empirical evidence, advancements in technology, and the refinement of theoretical frameworks.
- Through systematic observation, experimentation, and critical analysis, scientists continuously revise and expand our understanding of the natural world.

- This iterative process leads to the development of new theories, methodologies, and technologies, contributing to the evolution of various scientific disciplines and our overall comprehension of the universe.
- The development of scientific knowledge is characterized by several key features. These include the continuous refinement of hypotheses through empirical testing, the rigorous scrutiny of experimental results, the peer review process for validating findings, and the continual integration of new discoveries with existing knowledge.
- This iterative process fosters a deeper understanding of natural phenomena, facilitates technological innovation, and contributes to the overall advancement of human society.
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Topic: Observation and experimentation:

Introduction:

- Observation involves carefully watching and recording natural phenomena, while experimentation refers to the controlled testing of hypotheses under specific conditions.
- Both are integral to the scientific method, allowing researchers to gather empirical data and draw meaningful conclusions.
- Through systematic observation and experimentation, scientists can uncover patterns, establish causal relationships, and refine their understanding of the natural world, thereby contributing to the development of scientific knowledge.

Topic: Development of scientific knowledge and classification:

Introduction:

- Classification in the context of scientific knowledge involves the organization and categorization of information based on shared characteristics and properties.
- It enables scientists to create systems that help understand, describe, and predict various phenomena within a specific field.

- By categorizing and classifying data, researchers can discern patterns, make comparisons, and derive meaningful insights that contribute to the advancement of scientific understanding and the development of new theories and principles.
- The development of scientific knowledge often involves the process of classification, where scientists organize information into categories based on shared properties and characteristics.
- Classification facilitates the systematic arrangement of data, enabling scientists to discern patterns, make comparisons, and draw conclusions that contribute to the formulation of theories and models.
- This organized approach not only aids in understanding complex phenomena but also paves the way for the development of new research directions and the refinement of existing scientific disciplines.
- Classification plays a crucial role in the development of scientific knowledge by enabling the establishment of systematic frameworks and taxonomies.
- By categorizing observations and experimental data, scientists can identify trends, relationships, and patterns that contribute to the construction of general principles and laws.
- Moreover, classification facilitates communication and collaboration within the scientific community, fostering a shared understanding of complex concepts and promoting the accumulation of knowledge across various disciplines.
- Classification in the context of scientific research can occur through various methods, depending on the specific field of study.
- Common approaches include taxonomy, where organisms are categorized based on shared characteristics, and typologies, which involve the grouping of objects or phenomena based on specific criteria.
- Additionally, in fields such as physics, chemistry, and social sciences, classification is often achieved through the identification of properties, behavior, or attributes that allow for the systematic organization of data into meaningful groups or categories.

- In scientific research, classification methods can include hierarchical systems, such as the Linnaean taxonomy in biology, which classifies organisms into a hierarchical structure based on shared characteristics.
- Other methods involve the use of numerical or categorical scales, clustering techniques, or typologies based on specific criteria.
- Furthermore, advancements in computational techniques have led to the development of sophisticated algorithms for data classification, enabling the automatic categorization of complex datasets in fields such as machine learning, data science, and artificial intelligence.
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The area of classification extends beyond the natural sciences and includes various disciplines such as library science, information technology, and economics.

- **In library science**, classification systems such as the Dewey Decimal System and the Library of Congress Classification help organize and retrieve information efficiently.
- **In information technology**, classification algorithms are utilized for tasks like image recognition, natural language processing, and recommendation systems.
- **In economics**, classification assists in categorizing goods, services, and economic activities, contributing to the analysis of market trends and the formulation of economic policies.