definition of repetition in science

definition of repetition in science is a foundational concept that underpins the reliability and validity of scientific investigations. Repetition refers to the process of conducting an experiment or observing a phenomenon multiple times to verify results and minimize the influence of random errors or anomalies. This article comprehensively explores the definition of repetition in science, its significance in various scientific fields, the difference between repetition and replication, and how repetition helps enhance the credibility of scientific studies. Readers will gain insight into the practical application of repetition, its impact on data analysis, common examples, and guidelines for its effective use. Whether you are a student, researcher, or science enthusiast, understanding the role of repetition in science is crucial for evaluating experimental outcomes and advancing scientific knowledge.

Understanding the Definition of Repetition in Science

Repetition in science refers to the act of performing an experiment, measurement, or observation multiple times to confirm the consistency and accuracy of the results. By repeating a procedure under the same or similar conditions, scientists aim to identify and reduce random errors, ensuring that the findings are not merely coincidental or influenced by uncontrolled variables. The definition of repetition in science is often closely associated with concepts such as reliability, precision, and reproducibility. Repetition allows researchers to validate their data and draw more robust conclusions, making it a critical aspect of the scientific method.

Core Elements of Repetition

- Conducting the same experiment several times
- Ensuring consistent methodology and controls

- Recording and analyzing results for consistency
- Identifying variations or anomalies in data
- Enhancing the credibility of scientific evidence

Why Repetition Matters in Science

The practice of repetition helps scientists distinguish between true patterns and random occurrences. By obtaining multiple sets of data, researchers can apply statistical analyses to determine the reliability of their findings. Repetition is also essential for building scientific consensus and for the peer review process, where other experts evaluate the repeatability of reported results. Overall, the definition of repetition in science is integral to producing trustworthy knowledge and advancing technological innovations.

The Importance of Repetition in Scientific Research

Repetition serves as a safeguard against errors and biases that may arise during scientific investigations. Its importance is highlighted in all areas of science, from laboratory experiments to field studies and observational research. Through repeated trials, scientists can identify potential sources of error and refine their experimental designs for greater accuracy.

Benefits of Repetition in Research

- Reduces random errors and increases data accuracy
- Supports statistical analysis and significance testing
- Improves confidence in experimental outcomes
- Facilitates peer review and scientific validation
- Helps identify outliers and anomalies

Repetition and the Scientific Method

Within the scientific method, repetition is a critical step that follows initial experimentation. After forming a hypothesis and conducting a preliminary test, researchers repeat procedures to ensure the results are consistent and reproducible. This iterative process helps refine hypotheses, confirm findings, and strengthen scientific theories over time.

Repetition vs. Replication: Key Differences

While repetition and replication are both essential for scientific rigor, they are distinct concepts. The definition of repetition in science involves repeating an experiment or measurement within the same study, often by the same researcher and under the same conditions. Replication, on the other hand, refers to independent researchers conducting the same study in different settings to verify results externally.

Comparing Repetition and Replication

- **Repetition:** Multiple trials performed by the original researcher within one study.
- **Replication:** Independent studies conducted by different researchers to confirm findings.
- Both practices contribute to scientific credibility and reliability.

Why Both Are Necessary

Repetition ensures the internal reliability of an experiment, while replication broadens the scope of verification. Scientific findings gain widespread acceptance only after successful repetition and replication, which together help eliminate biases and validate universal principles.

Applications of Repetition in Various Scientific Fields

The definition of repetition in science is applied across diverse disciplines. Each field uses repetition to strengthen research outcomes and ensure data integrity. Whether in controlled laboratory environments or complex natural settings, repetition remains a crucial tool for scientific inquiry.

Physical Sciences

In physics and chemistry, experiments are often repeated to confirm measurements, test theories, and calibrate instruments. Multiple trials help identify systematic errors and improve precision.

Biological Sciences

Biological research relies heavily on repetition to account for natural variability in living organisms. Repeating experiments helps distinguish between biological noise and true effects, strengthening the validity of results.

Social Sciences

In psychology, sociology, and education, repetition is used to verify survey responses, behavioral observations, and intervention outcomes. It helps control for participant variability and external influences.

Environmental and Earth Sciences

Field studies involving environmental sampling or geological surveys utilize repetition to ensure that measurements reflect actual conditions rather than isolated incidents or measurement errors.

How Repetition Strengthens Experimental Reliability

Reliability is a measure of the consistency and dependability of experimental results. The definition of repetition in science directly correlates with higher reliability, as repeated measures increase the statistical power and accuracy of findings. Reliable experiments are more likely to be accepted by the scientific community and form the basis for further research.

Statistical Advantages of Repetition

- Increases sample size, improving statistical significance
- Reduces the impact of outliers and random errors
- Allows for calculation of mean, median, and variance
- Strengthens confidence intervals and predictive models

Quality Control and Assurance

Industries such as pharmaceuticals, manufacturing, and food science rely on repetition for quality control. Repeated testing ensures products meet safety and performance standards, protecting consumers and enhancing public trust.

Examples of Repetition in Scientific Experiments

Practical examples help illustrate the definition of repetition in science and its everyday application. By examining real-world scenarios, readers can better understand how repetition is used to validate and improve scientific research.

Laboratory Experiments

A chemist conducting a titration repeats the procedure multiple times to confirm the accuracy of the concentration calculation. Each trial is documented, and the average value is used to report the final result.

Field Studies

Ecologists sampling water quality at different times and locations repeat measurements to ensure results are representative of the entire ecosystem, not just one moment or place.

Medical Research

Clinical trials include repeated testing of treatments across various patient groups to assess effectiveness and identify potential side effects. Repetition helps ensure that outcomes are not due to chance or unique individual responses.

Best Practices for Implementing Repetition

To maximize the benefits of repetition, scientists must follow established guidelines and protocols. Proper implementation ensures that repeated trials yield meaningful and reliable data.

Planning for Repetition

- Define clear objectives and criteria for repetition
- Control variables to maintain consistency
- Document all procedures and deviations
- Perform statistical analyses on repeated data
- Report both individual and aggregated results

Challenges in Repetition

Factors such as resource limitations, time constraints, and variability in biological or environmental systems can make repetition challenging. Scientists must balance thoroughness with practical feasibility while ensuring scientific rigor.

Common Mistakes and Misconceptions about

Repetition

Misunderstanding the definition of repetition in science can lead to inaccurate conclusions or wasted resources. It is important to recognize and avoid common errors associated with repetitive procedures.

Mistaking Repetition for Replication

Some may confuse repetition with replication, assuming that repeating an experiment by the same researcher is equivalent to independent verification. Both processes are necessary but serve different purposes in scientific validation.

Overlooking the Need for Controls

Repetition without proper controls may not reduce systematic errors. Controls help isolate the effect of the independent variable and ensure that repeated trials are meaningful.

Ignoring Statistical Analysis

Repeating an experiment is only valuable when results are subjected to appropriate statistical tests. Neglecting data analysis can lead to misleading interpretations and diminished reliability.

Assuming More Repetition Always Equals Better Results

While repetition improves reliability, excessive repetition without thoughtful design may waste resources. The quality of repeated trials is as important as their quantity.

Trending and Relevant Questions and Answers about Definition of Repetition in Science

Q: What is the definition of repetition in science?

A: Repetition in science refers to performing an experiment, measurement, or observation multiple times to ensure results are consistent and reliable, minimizing random errors.

Q: Why is repetition important in scientific experiments?

A: Repetition is important because it increases the reliability and accuracy of results, helps identify errors or anomalies, and supports statistical analysis for meaningful conclusions.

Q: How does repetition differ from replication in scientific research?

A: Repetition involves repeating trials within the same study, usually by the same researcher, while replication refers to independent studies by different researchers to confirm findings.

Q: What are examples of repetition in science?

A: Examples include repeating chemical titrations in a laboratory, conducting multiple surveys in social science research, and performing repeated field measurements in environmental studies.

Q: Can repetition help detect errors in experiments?

A: Yes, repetition can reveal inconsistencies or errors by comparing results across multiple trials, allowing researchers to refine their methods and improve data accuracy.

Q: What role does repetition play in the scientific method?

A: Repetition is a key step in the scientific method, used to confirm the validity of results and ensure that findings are not due to chance or uncontrolled variables.

Q: Are there drawbacks to excessive repetition in science?

A: Excessive repetition without proper experimental design can waste resources and time. It is important to balance the number of trials with methodological rigor.

Q: How does repetition contribute to statistical analysis?

A: Repetition increases sample size, reduces random errors, and allows for robust statistical tests such as calculating averages, variances, and confidence intervals.

Q: What is the difference between reliability and validity in relation to repetition?

A: Reliability refers to the consistency of results through repetition, while validity concerns whether the experiment measures what it is intended to measure.

Q: What are common mistakes when applying repetition in science?

A: Common mistakes include confusing repetition with replication, failing to use controls, neglecting statistical analysis, and assuming that more repetition automatically improves results.

Definition Of Repetition In Science

The Definition of Repetition in Science: Ensuring Reliable Results

Science thrives on reliability. A single experiment, no matter how meticulously performed, isn't enough to establish a scientific truth. This is where the crucial concept of repetition comes in. This post will delve into the precise definition of repetition in science, exploring its different forms, its importance in validating findings, and how it contributes to the overall robustness of scientific knowledge. We'll unpack the nuances, clarifying common misconceptions and highlighting its critical role in the scientific method.

What is Repetition in Scientific Research?

At its core, the definition of repetition in science refers to the process of repeating an experiment or observation multiple times under essentially the same conditions. This isn't simply about performing the same experiment again; it involves a conscious effort to maintain consistency across all variables, except for the ones being deliberately manipulated. The goal is to confirm the initial results and assess their reproducibility. A single positive outcome, for example, might be due to chance or error. Consistent repetition, however, strengthens the likelihood that the observed effect is genuine and not a fluke.

Types of Repetition in Science

Repetition manifests in various ways within scientific research:

Direct Replication: This involves repeating the exact same experiment using the same methods, materials, and procedures as the original study. It's the gold standard for verifying results.

Conceptual Replication: This involves testing the same hypothesis using different methods, materials, or procedures. This demonstrates the robustness of the finding beyond the specifics of the original study and assesses its generalizability.

Systematic Replication: This involves a planned series of repetitions, often involving variations in the experimental conditions to explore the limits of the effect. This helps in establishing the boundaries and scope of the phenomenon being studied.

Replication Crisis: It is important to note that the failure to replicate results is also a significant element of the scientific process. The inability to replicate previous findings highlights potential flaws in the original methodology or necessitates further investigation to uncover underlying factors. The so-called "replication crisis" in certain fields points to the importance of rigorous replication protocols.

The Importance of Repetition in Establishing Scientific Validity

The importance of repetition in science cannot be overstated. It serves several crucial functions:

Minimizing Error: Repetition helps identify and minimize both random and systematic errors. Random errors are unpredictable fluctuations, while systematic errors are consistent biases. Repeating the experiment allows researchers to detect and compensate for these errors.

Increasing Confidence in Results: Consistent results across multiple repetitions significantly enhance the confidence level in the findings. This builds stronger evidence for a hypothesis or theory.

Improving Generalizability: Successful replication across different settings and contexts strengthens the generalizability of the findings. This indicates that the observed effect isn't limited to specific circumstances but applies more broadly.

Identifying Outliers and Anomalies: Repetition can reveal outliers – data points that deviate significantly from the overall pattern. These outliers can indicate experimental errors or suggest the presence of unexpected factors influencing the outcome.

Challenges and Limitations of Repetition

While repetition is crucial, it's not without its challenges:

Cost and Time: Repeating experiments, especially complex ones, can be expensive and time-

consuming.

Reproducibility Issues: Sometimes, it's challenging to achieve true reproducibility due to subtle variations in materials, equipment, or experimental procedures. This underscores the importance of detailed documentation.

Publication Bias: Studies with positive results are more likely to be published than those with negative or null results, potentially creating a biased view of the scientific literature.

Human Error: Even with careful planning, human error can influence experimental outcomes. This highlights the need for rigorous quality control procedures.

Conclusion

The definition of repetition in science ultimately boils down to a fundamental principle of ensuring the reliability and validity of scientific findings. It's an integral part of the scientific method, contributing to the accumulation of robust and trustworthy knowledge. By understanding the different types of repetition and its inherent limitations, scientists can strive for higher accuracy and improve the overall integrity of their research. The consistent pursuit of reproducible results is not merely a technical detail; it's the cornerstone of scientific progress.

Frequently Asked Questions (FAQs)

1. Is repetition the same as replication? While often used interchangeably, replication emphasizes the rigorous attempt to reproduce the original findings, whereas repetition might encompass broader instances of repeated measurements or observations within a single experiment.

2. How many times should an experiment be repeated? There's no single answer; the required number of repetitions depends on factors such as the variability of the data, the desired level of statistical significance, and the resources available. Statistical power analysis can help determine an appropriate sample size.

3. What should I do if I cannot replicate a scientific finding? Failure to replicate is not necessarily a failure. It often necessitates a careful re-examination of the original study's methods, the consideration of potential confounding variables, and possibly further research to understand the discrepancies.

4. How important is detailed documentation in scientific repetition? Detailed documentation is paramount. It allows others to scrutinize the methodology, identify potential sources of error, and attempt replication independently. This contributes to transparency and accountability.

5. How does repetition contribute to the development of scientific theories? Successful repetition across various contexts strengthens the evidence supporting a hypothesis and increases its

likelihood of becoming a well-established scientific theory, ultimately shaping our understanding of the natural world.

definition of repetition in science: Reproducibility and Replicability in Science National Academies of Sciences, Engineering, and Medicine, Policy and Global Affairs, Committee on Science, Engineering, Medicine, and Public Policy, Board on Research Data and Information, Division on Engineering and Physical Sciences, Committee on Applied and Theoretical Statistics, Board on Mathematical Sciences and Analytics, Division on Earth and Life Studies, Nuclear and Radiation Studies Board, Division of Behavioral and Social Sciences and Education, Committee on National Statistics, Board on Behavioral, Cognitive, and Sensory Sciences, Committee on Reproducibility and Replicability in Science, 2019-10-20 One of the pathways by which the scientific community confirms the validity of a new scientific discovery is by repeating the research that produced it. When a scientific effort fails to independently confirm the computations or results of a previous study, some fear that it may be a symptom of a lack of rigor in science, while others argue that such an observed inconsistency can be an important precursor to new discovery. Concerns about reproducibility and replicability have been expressed in both scientific and popular media. As these concerns came to light, Congress requested that the National Academies of Sciences, Engineering, and Medicine conduct a study to assess the extent of issues related to reproducibility and replicability and to offer recommendations for improving rigor and transparency in scientific research. Reproducibility and Replicability in Science defines reproducibility and replicability and examines the factors that may lead to non-reproducibility and non-replicability in research. Unlike the typical expectation of reproducibility between two computations, expectations about replicability are more nuanced, and in some cases a lack of replicability can aid the process of scientific discovery. This report provides recommendations to researchers, academic institutions, journals, and funders on steps they can take to improve reproducibility and replicability in science.

definition of repetition in science: Encyclopedia of the Sciences of Learning Norbert M. Seel, 2011-10-05 Over the past century, educational psychologists and researchers have posited many theories to explain how individuals learn, i.e. how they acquire, organize and deploy knowledge and skills. The 20th century can be considered the century of psychology on learning and related fields of interest (such as motivation, cognition, metacognition etc.) and it is fascinating to see the various mainstreams of learning, remembered and forgotten over the 20th century and note that basic assumptions of early theories survived several paradigm shifts of psychology and epistemology. Beyond folk psychology and its naïve theories of learning, psychological learning theories can be grouped into some basic categories, such as behaviorist learning theories, connectionist learning theories, cognitive learning theories, constructivist learning theories, and social learning theories. Learning theories are not limited to psychology and related fields of interest but rather we can find the topic of learning in various disciplines, such as philosophy and epistemology, education, information science, biology, and – as a result of the emergence of computer technologies – especially also in the field of computer sciences and artificial intelligence. As a consequence, machine learning struck a chord in the 1980s and became an important field of the learning sciences in general. As the learning sciences became more specialized and complex, the various fields of interest were widely spread and separated from each other; as a consequence, even presently, there is no comprehensive overview of the sciences of learning or the central theoretical concepts and vocabulary on which researchers rely. The Encyclopedia of the Sciences of Learning provides an up-to-date, broad and authoritative coverage of the specific terms mostly used in the sciences of learning and its related fields, including relevant areas of instruction, pedagogy, cognitive sciences, and especially machine learning and knowledge engineering. This modern compendium will be an indispensable source of information for scientists, educators, engineers, and technical staff active in all fields of learning. More specifically, the Encyclopedia provides fast access to the most relevant theoretical terms provides up-to-date, broad and authoritative coverage of the

most important theories within the various fields of the learning sciences and adjacent sciences and communication technologies; supplies clear and precise explanations of the theoretical terms, cross-references to related entries and up-to-date references to important research and publications. The Encyclopedia also contains biographical entries of individuals who have substantially contributed to the sciences of learning; the entries are written by a distinguished panel of researchers in the various fields of the learning sciences.

definition of repetition in science: Gilles Deleuze's Difference and Repetition James Williams, 2013-01-31 A new edition of this introduction to Deleuze's seminal work, Difference and Repetition, with new material on intensity, science and action and new engagements with Bryant, Sauvagnargues, Smith, Somers-Hall and de Beistegui.

definition of repetition in science: Imagination and Science in Romanticism Richard C. Sha, 2021-03-02 How did the idea of the imagination impact Romantic literature and science? 2018 Winner, Jean-Pierre Barricelli Book Prize, The International Conference on Romanticism Richard C. Sha argues that scientific understandings of the imagination indelibly shaped literary Romanticism. Challenging the idea that the imagination found a home only on the side of the literary, as a mental vehicle for transcending the worldly materials of the sciences, Sha shows how imagination helped to operationalize both scientific and literary discovery. Essentially, the imagination forced writers to consider the difference between what was possible and impossible while thinking about how that difference could be known. Sha examines how the imagination functioned within physics and chemistry in Percy Bysshe Shelley's Prometheus Unbound, neurology in Blake's Vala, or The Four Zoas, physiology in Coleridge's Biographia Literaria, and obstetrics and embryology in Mary Shelley's Frankenstein. He also demonstrates how the imagination was called upon to do aesthetic and scientific work using primary examples taken from the work of scientists and philosophers Davy, Dalton, Faraday, Priestley, Kant, Mary Somerville, Oersted, Marcet, Smellie, Swedenborg, Blumenbach, Buffon, Erasmus Darwin, and Von Baer, among others. Sha concludes that both fields benefited from thinking about how imagination could cooperate with reason—but that this partnership was impossible unless imagination's penchant for fantasy could be contained.

definition of repetition in science: Fostering Integrity in Research National Academies of Sciences, Engineering, and Medicine, Policy and Global Affairs, Committee on Science, Engineering, Medicine, and Public Policy, Committee on Responsible Science, 2018-01-13 The integrity of knowledge that emerges from research is based on individual and collective adherence to core values of objectivity, honesty, openness, fairness, accountability, and stewardship. Integrity in science means that the organizations in which research is conducted encourage those involved to exemplify these values in every step of the research process. Understanding the dynamics that support â€ or distort â€ practices that uphold the integrity of research by all participants ensures that the research enterprise advances knowledge. The 1992 report Responsible Science: Ensuring the Integrity of the Research Process evaluated issues related to scientific responsibility and the conduct of research. It provided a valuable service in describing and analyzing a very complicated set of issues, and has served as a crucial basis for thinking about research integrity for more than two decades. However, as experience has accumulated with various forms of research misconduct, detrimental research practices, and other forms of misconduct, as subsequent empirical research has revealed more about the nature of scientific misconduct, and because technological and social changes have altered the environment in which science is conducted, it is clear that the framework established more than two decades ago needs to be updated. Responsible Science served as a valuable benchmark to set the context for this most recent analysis and to help guide the committee's thought process. Fostering Integrity in Research identifies best practices in research and recommends practical options for discouraging and addressing research misconduct and detrimental research practices.

definition of repetition in science: The Art of Scientific Discovery George Gore, 1878

definition of repetition in science: *Science* John Michels (Journalist), 1888 Since Jan. 1901 the official proceedings and most of the papers of the American Association for the Advancement of

Science have been included in Science.

definition of repetition in science: A Dictionary of Science, Literature, & Art William Thomas Brande, 1842

definition of repetition in science: Starting Science...Again? Martin Braund, 2008-10-09 ′The structure [of this book] encourages active participation via reflective activity boxes which further allows for the engagement and consolidation of ideas...Evidence based research is cited resulting in the author suggesting a number of practical activities to encourage progression and continuity in science′ - ESCalate Why do pupils′ learning and motivation slow down markedly as they move from primary to secondary school? Why is this situation worse in science than in any other curriculum subject? This book combines reports of and reflection on best practice in improving progression and continuity of teaching and learning in science - particularly at that transition stage between primary and secondary school. Presenting the views of teachers and pupils on progression, learning and application of science, the book suggests practical ways of improving teaching and learning in science. Each chapter includes examples of learning materials with notes on how these might be used or adapted by teachers in their own classroom settings. Science teaching in secondary schools is often based on assumptions that children know or can do very little, so the job in the secondary school becomes one of showing pupils how to start ′doing science properly′, as if from scratch. The damage that this false view can do to pupils′ learning, motivation and confidence is clear. This book will help teachers to assess children′s prior knowledge effectively and build meaningful and enjoyable science lessons.

definition of repetition in science: A Dictionary of Science, Literature and Art, Comprising the Definitions and Derivations of the Scientific Terms in General Use ... William Thomas Brande, 1875

definition of repetition in science: Empirical Philosophy of Science Susann Wagenknecht, Nancy J. Nersessian, Hanne Andersen, 2015-06-12 The book examines the emerging approach of using qualitative methods, such as interviews and field observations, in the philosophy of science. Qualitative methods are gaining popularity among philosophers of science as more and more scholars are resorting to empirical work in their study of scientific practices. At the same time, the results produced through empirical work are quite different from those gained through the kind of introspective conceptual analysis more typical of philosophy. This volume explores the benefits and challenges of an empirical philosophy of science and addresses questions such as: What do philosophers gain from empirical work? How can empirical research help to develop philosophical concepts? How do we integrate philosophical frameworks and empirical research? What constraints do we accept when choosing an empirical approach? What constraints does a pronounced theoretical focus impose on empirical work? Nine experts discuss their thoughts and empirical results in the chapters of this book with the aim of providing readers with an answer to these questions.

definition of repetition in science: *Characterizing the Robustness of Science* Léna Soler, Emiliano Trizio, Thomas Nickles, William Wimsatt, 2012-03-22 Mature sciences have been long been characterized in terms of the "successfulness", "reliability" or "trustworthiness" of their theoretical, experimental or technical accomplishments. Today many philosophers of science talk of "robustness", often without specifying in a precise way the meaning of this term. This lack of clarity is the cause of frequent misunderstandings, since all these notions, and that of robustness in particular, are connected to fundamental issues, which concern nothing less than the very nature of science and its specificity with respect to other human practices, the nature of rationality and of scientific progress; and science's claim to be a truth-conducive activity. This book offers for the first time a comprehensive analysis of the problem of robustness, and in general, that of the reliability of science, based on several detailed case studies and on philosophical essays inspired by the so-called practical turn in philosophy of science.

definition of repetition in science: *A Dictionary of Science, Literature, and Art ... With the derivation and definition of all the terms in general use. Edited by W. T. Brande ... assisted by Joseph*

Cauvin, etc William Thomas BRANDE, 1847

definition of repetition in science: Natural Science , 1895

definition of repetition in science: A Dictionary of Science, Literature, and Art William Thomas Brande, George William Cox, 1872

definition of repetition in science: PISA 2015 Results (Volume II) Policies and Practices for Successful Schools OECD, 2016-12-06 The OECD Programme for International Student Assessment (PISA) examines not just what students know in science, reading and mathematics, but what they can do with what they know. Results from PISA show educators and policy makers the quality and equity of learning outcomes achieved elsewhere ...

definition of repetition in science: *The American Phrenological Journal and Repository of Science, Literature and General Intelligence* , 1851

definition of repetition in science: Science and Sociology Sheldon Ekland-Olson, Jack P. Gibbs, 2017-09-01 Science and Sociology is from beginning to end an exploration of what this implies for the social sciences, and sociology in particular. The authors argue that over the last several decades, sociology has become less a science and more a quest for isolated assessments of situations, whether they come from demographic analyses, survey research, or ethnographic studies. Above all else, this book is an attempt to promote and advance scientific sociology, and we write at length specifying the how and why of this objective. With this objective in mind, the question becomes: What would a scientific sociology look like?

definition of repetition in science: An Aristotelian Account of Induction Louis F. Groarke, 2009-11-01 In An Aristotelian Account of Induction Groarke discusses the intellectual process through which we access the first principles of human thought - the most basic concepts, the laws of logic, the universal claims of science and metaphysics, and the deepest moral truths. Following Aristotle and others, Groarke situates the first stirrings of human understanding in a creative capacity for discernment that precedes knowledge, even logic. Relying on a new historical study of philosophical theories of inductive reasoning from Aristotle to the twenty-first century, Groarke explains how Aristotle offers a viable solution to the so-called problem of induction, while offering new contributions to contemporary accounts of reasoning and argument and challenging the conventional wisdom about induction.

definition of repetition in science: Science and Global Challenges of the 21st Century – Innovations and Technologies in Interdisciplinary Applications Ekaterina Isaeva, Álvaro Rocha, 2023-05-25 This book comprises proceedings of the 2022 International Forum “Science and Global Challenges of the XXI Century”. The main principle of the Forum’s program is interdisciplinarity, the formation of end-to-end innovation chains: fundamental and applied research, technology development, implementation, and wide application of networks and systems. In 2022, the central theme of the forum is innovations and technologies in interdisciplinary applications. The book covers a wide range of knowledge-communication methodologies and effective technologies for processing data in various forms and areas. The book might interest researchers working at the interface of disciplines, such as e-learning, digital humanities, computational linguistics, cognitive studies, GIS, digital geography, machine learning, and others. It can also be a valuable source of information for Bachelor and Master students with open curricula or majors and minors who seek to find a balance between several fields of their interest.

definition of repetition in science: Discourse Patterns in Spoken and Written Corpora Karin Aijmer, Anna-Brita Stenström, 2004-01-01 This book brings together a number of empirical studies that use corpora to study discourse patterns in speech and writing. It explores new trends in the area of text and discourse characterized by the alliance between text linguistics and areas such as corpus linguistics, genre analysis, literary stylistics and cross-linguistic studies. The contributions to the volume show how established corpora can be used to ask a number of new questions about the interface between speech and writing, the relation between grammar and discourse, academic discourse, cohesive markers, stylistic devices such as metaphor, deixis and non-verbal communication. The corpora used for text-analysis can also be tailor-made for the study of particular

genres such as journal article abstracts, lectures, e-mailing list messages, headlines and titles. A recent development is to bring in contrastive data from bilingual corpora to show what is language-specific in the organization of the text.

definition of repetition in science: Auravana Social System Auravana, 2022-07-12 This publication is the Social System for a community-type society; it is a standardized social system for the organized structuring of a mutually fulfilled social population. A social system describes the organized structuring of a social environment. A social system is a grouping of units of individuation (here, units of consciousness) forming a cooperative network in which information is shared and integrated through a whole, data structure. The term social system is used, in general, to refer to lifeforms in definite relation to each other, which have enduring patterns of behavior in that relationship. This social system standard identifies humanity's aligned interests, and that which everyone has socially in common. It is an organizing system for social navigation that specifies a direction, orientation, and approach to socio-technical life. The standard details the purpose for the society's existence (a direction), its value system (an orientation), and its approach (a methodology and methods). Herein, these concepts, their relationships and understandings, are defined and modeled. Discursive reasoning is provided for the selection of this specific configuration of a social system, as opposed to the selection and encoding of other configurations, and their consequences are evidenced. The social system provides a description of who humanity is, and where humanity is going, by identifying its social organization.

definition of repetition in science: The Deeper Dimension of Yoga Georg Feuerstein, Ph.D., 2003-07-08 An in-depth primer on the history, philosophy, spirituality, and current practices of yoga, from a respected scholar and longtime yoga practitioner Here is a comprehensive survey of the full breadth and depth of the 5,000-year-old Yoga tradition, emphasizing its potent philosophy and spiritual vision. Georg Feuerstein demonstrates that Yoga is much more than a system of physical exercises—it is a profound path of self-transformation that encompasses a range of teachings, practices, and sacred texts that can help us cultivate wisdom, balance, and inner freedom, as well as physical health. Feuerstein is one of the few Western scholar-teachers of Yoga whose writing and teaching penetrate the full richness and depth of this ancient tradition. Here he offers a collection of essays touching on all facets of the discipline. Topics include: • The different branches and styles of Yoga • The ethical teachings of Yoga • Yoga and vegetarianism • Meditation and mantras • Choosing a teacher • Tantric Yoga • The experience of ecstasy

definition of repetition in science: Teaching Reading Skills in Secondary Schools , 1970

definition of repetition in science: The Psychology of Science Text Comprehension Jose Otero, Jos, A. Le¢n, Arthur C. Graesser, 2014-04-04 This volume's goal is to provide readers with up-to-date information on the research and theory of scientific text comprehension. It is widely acknowledged that the comprehension of science and technological artifacts is very difficult for both children and adults. The material is conceptually complex, there is very little background knowledge for most individuals, and the materials are often poorly written. Therefore, it is no surprise that students are turned off from learning science and technology. Given these challenges, it is important to design scientific text in a fashion that fits the cognitive constraints of the learner. The enterprise of textbook design needs to be effectively integrated with research in discourse processing, educational technology, and cognitive science. This book takes a major step in promoting such an integration. This volume: *provides an important integration of research and theory with theoretical, methodological, and educational applications; *includes a number of chapters that cover how science text information affects mental representations and strategies; *introduces important suggestions about how text design and new technologies can be thought of as pedagogical features; and *establishes academic text taxonomies and a consensus of the criteria to organize inferences and other mental mechanisms.

definition of repetition in science: Realism and the Aim of Science Karl Popper, 2013-04-15 Realism and the Aim of Science is one of the three volumes of Karl Popper's Postscript to the Logic of scientific Discovery. The Postscript is the culmination of Popper's work in the philosophy of

physics and a new famous attack on subjectivist approaches to philosophy of science. Realism and the Aim of Science is the first volume of the Postcript. Popper here formulates and explains his non-justificationist theory of knowledge: science aims at true explanatory theories, yet it can never prove, or justify, any theory to be true, not even if is a true theory. Science must continue to question and criticise all its theories, even those that happen to be true. Realism and the Aim of Science presents Popper's mature statement on scientific knowledge and offers important insights into his thinking on problems of method within science.

definition of repetition in science: Reviews Of Accelerator Science And Technology - Volume 6: Accelerators For High Intensity Beams Alexander Wu Chao, Weiren Chou, 2014-04-01 As particle accelerators strive forever increasing performance, high intensity particle beams become one of the critical demands requested across the board by a majority of accelerator users (proton, electron and ion) and for most applications. Much effort has been made by our community to pursue high intensity accelerator performance on a number of fronts. Recognizing its importance, we devote this volume to Accelerators for High Intensity Beams. High intensity accelerators have become a frontier and a network for innovation. They are responsible for many scientific discoveries and technological breakthroughs that have changed our way of life, often taken for granted. A wide range of topics is covered in the fourteen articles in this volume.

definition of repetition in science: Frames of Referents Jill Robbins, 1997 This book examines the work of Guillermo Carnero, one of Spain's most important contemporary poets, in the context of the critical theories developed in the West after World War II that inform all of Carnero's writing. Previous critical studies have tried to link Carnero's poetry to that of other novisimo poets within the narrow confines of Spanish poetics and literary history. This study seeks to move beyond the limiting perspective of the Spanish generational paradigm.--BOOK JACKET.Title Summary field provided by Blackwell North America, Inc. All Rights Reserved

definition of repetition in science: Powerful Ideas of Science and How to Teach Them Jasper Green, 2020-07-19 A bullet dropped and a bullet fired from a gun will reach the ground at the same time. Plants get the majority of their mass from the air around them, not the soil beneath them. A smartphone is made from more elements than you. Every day, science teachers get the opportunity to blow students' minds with counter-intuitive, crazy ideas like these. But getting students to understand and remember the science that explains these observations is complex. To help, this book explores how to plan and teach science lessons so that students and teachers are thinking about the right things – that is, the scientific ideas themselves. It introduces you to 13 powerful ideas of science that have the ability to transform how young people see themselves and the world around them. Each chapter tells the story of one powerful idea and how to teach it alongside examples and non-examples from biology, chemistry and physics to show what great science teaching might look like and why. Drawing on evidence about how students learn from cognitive science and research from science education, the book takes you on a journey of how to plan and teach science lessons so students acquire scientific ideas in meaningful ways. Emphasising the important relationship between curriculum, pedagogy and the subject itself, this exciting book will help you teach in a way that captivates and motivates students, allowing them to share in the delight and wonder of the explanatory power of science.

definition of repetition in science: Towards a science of ideas: An inquiry into the emergence, evolution and expansion of ideas and their translation into action Guido Enthoven, Seweryn Rudnicki, Rico Sneller, 2022-08-02 Ideas are the basic building blocks that construct the world we live in. Yet despite the abundance of literature on creativity and innovation, there has been little reflection on ideas as such, their nature and their working mechanisms. This book provides foundations for a reflection focused specifically on ideas - what they are, how they emerge, develop, interact, gain acceptance and become translated into actions. In doing so the book moves beyond the mainstream approaches, offering new, promising theoretical angles, presenting original findings and initiating a research agenda for a science of ideas. This book provides a fresh perspective on how to conceptualize and study ideas and their working mechanisms by treating

ideas as the main object of the study and by bringing together a group of original thinkers, scholars, and philosophers to move beyond the mainstream academic discourse on creativity and innovation.

definition of repetition in science: Data Architecture: A Primer for the Data Scientist W.H. Inmon, Daniel Linstedt, Mary Levins, 2019-04-30 Over the past 5 years, the concept of big data has matured, data science has grown exponentially, and data architecture has become a standard part of organizational decision-making. Throughout all this change, the basic principles that shape the architecture of data have remained the same. There remains a need for people to take a look at the bigger picture and to understand where their data fit into the grand scheme of things. Data Architecture: A Primer for the Data Scientist, Second Edition addresses the larger architectural picture of how big data fits within the existing information infrastructure or data warehousing systems. This is an essential topic not only for data scientists, analysts, and managers but also for researchers and engineers who increasingly need to deal with large and complex sets of data. Until data are gathered and can be placed into an existing framework or architecture, they cannot be used to their full potential. Drawing upon years of practical experience and using numerous examples and case studies from across various industries, the authors seek to explain this larger picture into which big data fits, giving data scientists the necessary context for how pieces of the puzzle should fit together. - New case studies include expanded coverage of textual management and analytics - New chapters on visualization and big data - Discussion of new visualizations of the end-state architecture

definition of repetition in science: Integrated Biomaterials Science Rolando Barbucci, 2007-05-08 Integrated Biomaterials Science provides an intriguing insight into the world of biomaterials. It explores the materials and technology which have brought advances in new biomaterials, highlighting the way in which modern biology and medicine are synergistically linked to other key scientific disciplines-physics, chemistry, and engineering. In doing so, Integrated Biomaterials Science contains chapters on tissue engineering and gene therapy, standards and parameters of biomaterials, applications and interactions within the industrial world, as well as potential aspects of patent regulations. Integrated Biomaterials Science serves as a comprehensive guide to understanding this dynamic field, yet is designed so that chapters may be read and understood independently, depending on the needs of the reader. Integrated Biomaterials Science is attractive to a broad audience interested in a deeper understanding of this evolving field, and serves as a key resource for researchers and students of biomaterials courses, providing all with an opportunity to probe further.

definition of repetition in science: *C Programming: The Essentials for Engineers and Scientists* David R. Brooks, 2012-12-06 This text teaches the essentials of C programming, concentrating on what readers need to know in order to produce stand-alone programs and so solve typical scientific and engineering problems. It is a learning-by-doing book, with many examples and exercises, and lays a foundation of scientific programming concepts and techniques that will prove valuable for those who might eventually move on to another language. Written for undergraduates who are familiar with computers and typical applications but are new to programming.

definition of repetition in science: *Wordsworth's Poetry of Repetition* , 2023-05-19 This book explores those moments of repetition, placing them in the early nineteenth century context from which they emerged, and teasing out through extended close attention to the poetry itself the complexities of repetition and recapitulation.

definition of repetition in science: The Origin of the Fittest Edward Drinker Cope, 1887

definition of repetition in science: Idealist Alternatives to Materialist Philosophies of Science , 2019-12-09 Idealist Alternatives to Materialist Philosophies of Science (ed. Philip MacEwen) makes the case that there are other, and arguably better, ways of understanding science than materialism. Philosophical idealism leads the list of challengers but critical realism and various forms of pluralism are fully articulated as well. To ensure that the incumbent is adequately represented, the volume includes a major defence of materialism/naturalism from Anaxagoras to the present. Contributors include Leslie Armour, John D. Norton, and Fred Wilson with a Foreword by Nicholas Rescher. For anyone interested in whether materialism has a monopoly on science, this volume presents a good

case for materialism but a better one for its alternatives.

definition of repetition in science: Science's First Mistake Ian O. Angell, Dionysios Demetis, 2012-11-13 This book seeks to deconstruct the process of scientific knowledge discovery and theory construction by scrutinizing the circumstances under which all scientific hypotheses are conceived. It concentrates on the interrelatedness of observation, paradox, delusion and self reference in scientific theory and method.

definition of repetition in science: Perspectives on Mankind's Search for Meaning Walter Taminang, 2008-06-18 This is a book with a positive message for a negative world. It is about the spiritual dimension of human experience. In it a precise thinker examines the ways in which we come to know; through science, religion, spirituality, philosophy, through faith, imagination and direct experience. This book examines the various pathways to spiritual understanding, provides sound and convincing arguments for any believer who also respects science, and explains why it is possible for various religions to co-exist peacefully. This is a hopeful, encouraging, and above all mature book, with timely news for a world convinced of its growing sophistication yet constantly displaying its deep anxiety and essential banality. This is a work with a beginning, middle and an end by a practical man of deep faith and unshaken conviction.

definition of repetition in science: Encyclopedia of Information Science and Technology, First Edition Khosrow-Pour, D.B.A., Mehdi, 2005-01-31 Comprehensive coverage of critical issues related to information science and technology.

definition of repetition in science: *Scientific and Technical Aerospace Reports* , 1995