

Biological Classification Pogil

12. The genus and species names are collectively referred to as the scientific name. It is written in a Latin format or binomial nomenclature, a two-name Latin naming system. There are three rules for writing a scientific name using this system. Analyze the information in Model 1 to complete the rules below:

Rule 1: The scientific name is always written in 2 parts, with the genus name written capitalized and the species name lowercase.

Rule 2: The scientific name is always written in Latin. If it is handwritten, it is written in cursive or underlined.

Rule 3: The first letter of the genus name is a capital letter.

13. This system is used all over the world. Why do you think Latin is used instead of a more modern language?

It is a common language for most people. It is a neutral language for all languages. It is a common language.

14. Using this system, would it be possible for two different species to have the same name?

No

15. In Linnaeus' time, classification was based on the appearance of organisms. Think about the appearance of organisms such as snakes and frogs, sharks and dolphins, and penguins and eagles. What are the limitations of classifying organisms by only their appearance?

You may miss some organisms that look alike but are not related. You may miss some organisms that look different but are related.

16. Considering advances in science, discuss with your group what might be a more reliable way to classify organisms. List at least three additional ways besides appearance.

- Behaviors
- ways to obtain food
- Adaptions to environment
- DNA analysis

Biological Classification

Biological Classification POGIL: Mastering the Art of Organizing Life

Are you struggling to understand the intricate world of biological classification? Does the sheer volume of living organisms feel overwhelming, making it difficult to grasp their relationships? Fear not! This comprehensive guide delves into the fascinating realm of biological classification using the POGIL (Process Oriented Guided Inquiry Learning) approach. We'll break down the complexities, providing you with a structured understanding of how scientists organize life on Earth. This post will equip you with the knowledge and tools necessary to confidently navigate the taxonomic hierarchy and confidently answer questions about classifying organisms.

Understanding the POGIL Method for Biological Classification

Before we dive into the specifics of biological classification, let's briefly understand the POGIL method. POGIL activities are designed to foster active learning. Instead of passively receiving information, you'll actively participate in the learning process by collaborating, analyzing, and drawing your own conclusions. This collaborative, inquiry-based approach is incredibly effective for grasping complex biological concepts like classification. In the context of biological classification, a POGIL activity might involve analyzing phylogenetic trees, comparing characteristics of different organisms, or deducing evolutionary relationships based on shared traits.

The Hierarchical Structure of Biological Classification

The cornerstone of biological classification is its hierarchical structure. This system, developed over centuries, organizes life into increasingly specific categories, mirroring evolutionary relationships.

The Major Taxonomic Ranks:

Domain: The broadest category, encompassing three major domains: Bacteria, Archaea, and Eukarya.

Kingdom: A large group of related phyla (or divisions in plants). Examples include Animalia, Plantae, Fungi, and Protista.

Phylum (or Division): Groups organisms with similar body plans or organizational structures.

Class: A further subdivision of a phylum, based on shared characteristics.

Order: Organisms within an order share more specific characteristics than those in a class.

Family: A group of closely related genera.

Genus: A group of closely related species.

Species: The most specific category, representing a group of organisms capable of interbreeding and producing fertile offspring.

Binomial Nomenclature:

A crucial component of biological classification is binomial nomenclature, a system of naming organisms using two Latin names: the genus and the species. For example, *Homo sapiens* designates humans. This standardized naming system avoids confusion caused by common names which vary across languages and regions.

Applying POGIL to Taxonomic Keys and Phylogenetic Trees

POGIL activities excel at helping students understand the practical application of classification systems. Two essential tools frequently used are taxonomic keys and phylogenetic trees.

Using Taxonomic Keys:

Taxonomic keys are essentially decision trees that guide you through a series of choices based on observable characteristics, ultimately leading to the identification of an organism. POGIL activities involving taxonomic keys encourage students to develop critical thinking skills and learn to meticulously observe and compare features.

Interpreting Phylogenetic Trees:

Phylogenetic trees, also known as cladograms, visually represent the evolutionary relationships between organisms. POGIL exercises often involve analyzing phylogenetic trees to deduce evolutionary relationships, identify common ancestors, and understand the branching patterns that reflect diversification over time. This allows students to move beyond rote memorization and engage with the dynamic process of evolution.

Common Challenges and How POGIL Can Help

Learning biological classification can present several challenges:

Memorization overload: The sheer number of taxonomic ranks and organisms can be overwhelming. POGIL helps by focusing on understanding the underlying principles rather than just memorizing facts.

Understanding evolutionary relationships: Grasping the evolutionary relationships between organisms is crucial but can be abstract. POGIL activities using phylogenetic trees make these relationships more tangible.

Applying classification systems: Many students struggle to apply taxonomic keys or interpret phylogenetic trees effectively. Interactive POGIL exercises provide opportunities for hands-on practice.

Conclusion

Biological classification is a cornerstone of biology, providing a framework for understanding the incredible diversity of life on Earth. By utilizing the POGIL method, you can transform the learning process from passive memorization to active inquiry. This approach fosters deeper understanding, critical thinking, and a more profound appreciation for the interconnectedness of all living things. Through interactive exercises, careful observation, and collaborative learning, you can master the art of biological classification and confidently navigate the fascinating world of taxonomy.

FAQs

1. What is the difference between a phylogenetic tree and a cladogram? While often used interchangeably, a cladogram specifically illustrates branching relationships based on shared derived characteristics, while a phylogenetic tree may also incorporate information about evolutionary time and branch lengths.
2. Why is binomial nomenclature important? It provides a universal, unambiguous naming system for organisms, avoiding the confusion caused by regional variations in common names.
3. How can I find POGIL activities specifically focused on biological classification? Many educational resources and websites offer POGIL activities on various biological topics, including classification. Search online for "POGIL biological classification activities" or check with your instructor or educational institution.
4. Are there online tools to help with creating or analyzing phylogenetic trees? Yes, several online tools are available, such as Phylogram, MEGA X, and iTOL, that allow you to create, edit, and analyze phylogenetic trees.
5. How does biological classification relate to conservation efforts? Understanding the evolutionary relationships and diversity of life is crucial for conservation. By classifying organisms, we can better understand their ecological roles and prioritize conservation efforts for threatened species and ecosystems.

biological classification pogil: *Classification and Biology* R.A. Crowson, 2017-07-12

Classification of plants and animals is of basic interest to biologists in all fields because correct formulation and generalization are based on sound taxonomy. This book by a world authority relates traditional taxonomic studies to developments in biochemical and other fields. It provides guidelines for the integration of modern and traditional methods and explains the underlying principles and philosophy of systematics. The problems of zoological, botanical, and paleontological classification are dealt with in great detail and microbial systematics briefly.

biological classification pogil: Taxonomy: The Classification of Biological Organisms

Kristi Lew, 2018-07-15 Through simple yet engaging language and detailed images and charts, readers will explore the work of Aristotle, Linnaeus, Darwin, and other well-known, and some not so well-known, figures throughout history who tried to make sense of the natural world, as well as the

breakthroughs and technologies that allow scientists to study organisms down to the genetic level. This book supports the Next Generation Science Standards on heredity and biological evolution by helping students understand how mutations lead to genetic variation, which in turn leads to natural selection. In addition, informative sidebars, a bibliography, and a Further Reading section with current books and educational websites will allow inquisitive minds to dive deeper into the evolutionary relationships among organisms.

biological classification pogil: Biological Classification Richard A. Richards, 2016-09-08 This book is a comprehensive introduction to the philosophical foundations and development of modern biological classification.

biological classification pogil: Principles and Techniques of Contemporary Taxonomy Donald L.J. Quicke, 2013-03-13 Taxonomy is an ever-changing, controversial and exciting field of biology. It has not remained motionless since the days of its founding fathers in the last century, but, just as with other fields of endeavour, it continues to advance in leaps and bounds, both in procedure and in philosophy. These changes are not only of interest to other taxonomists, but have far reaching implications for much of the rest of biology, and they have the potential to reshape a great deal of current biological thought, because taxonomy underpins much of biological methodology. It is not only important that an ethologist, physiologist, biochemist or ecologist can obtain information about the identities of the species which they are investigating; biology is also uniquely dependent on the comparative method and on the need to generalize. Both of these necessitate knowledge of the evolutionary relationships between organisms, and it is the science of taxonomy that can develop testable phylogenetic hypotheses and ultimately provide the best estimates of evolutionary history and relationships.

biological classification pogil: Classification and Biology Roy Albert Crowson, 1971

biological classification pogil: Kingdoms, Empires, and Domains Mark A. Ragan, 2023 This work explores how living organisms have been classified at the highest level. The earliest ideas of nature emphasised transformation. Aristotle recognised that certain objects in the sea share properties of plants and animals; these became known as zoophytes. The narrative follows zoophytes and other transgressive beings through subsequent philosophical and religious traditions, myths, travellers' tales, the occult literature, alchemy, scholasticism, the consolidation of vernacular languages, and the rise of scientific botany and zoology. Leeuwenhoek's discovery of microscopic beings, and Trembley studies on Hydra, complicated the plant-animal dichotomy. Transformation returned as Needham, Buffon and others observed plant material to generate motile animalcules; Linnaeus proposed a Regnum Chaoticum. New challenges arose as the Great Chain of Being was abandoned, algae were observed to liberate free-swimming zoospores, and cell theory was refined. Biology developed differently in France, Germany and Britain, and we follow the rise and fall of supernumerary kingdoms in each environment. Haeckel positioned Protista as one of two, three or four kingdoms. In the Twentieth century the living world was divided between prokaryotes and eukaryotes, while mitochondria and plastids were recognised as descendants of endosymbiotic bacteria. Molecular evidence revealed three domains (Archaea, Bacteria, Eukaryota), although many genomes are linked in a dynamic network of genetic relationships. Environmental genomes now threaten to undermine Eukaryota as an independent domain of life--

biological classification pogil: Cladistics David M. Williams, Malte C. Ebach, 2020-08-06 This new edition of a foundational text presents a contemporary review of cladistics, as applied to biological classification. It provides a comprehensive account of the past fifty years of discussion on the relationship between classification, phylogeny and evolution. It covers cladistics in the era of molecular data, detailing new advances and ideas that have emerged over the last twenty-five years. Written in an accessible style by internationally renowned authors in the field, readers are straightforwardly guided through fundamental principles and terminology. Simple worked examples and easy-to-understand diagrams also help readers navigate complex problems that have perplexed scientists for centuries. This practical guide is an essential addition for advanced undergraduates, postgraduates and researchers in taxonomy, systematics, comparative biology, evolutionary biology

and molecular biology.

biological classification pogil: POGIL Activities for High School Biology High School POGIL Initiative, 2012

biological classification pogil: *POGIL Activities for AP Biology* , 2012-10

biological classification pogil: Biology for AP® Courses Julianne Zedalis, John Eggebrecht, 2017-10-16 Biology for AP® courses covers the scope and sequence requirements of a typical two-semester Advanced Placement® biology course. The text provides comprehensive coverage of foundational research and core biology concepts through an evolutionary lens. Biology for AP® Courses was designed to meet and exceed the requirements of the College Board's AP® Biology framework while allowing significant flexibility for instructors. Each section of the book includes an introduction based on the AP® curriculum and includes rich features that engage students in scientific practice and AP® test preparation; it also highlights careers and research opportunities in biological sciences.

biological classification pogil: *POGIL Activities for High School Chemistry* High School POGIL Initiative, 2012

biological classification pogil: *Chemistry 2e* Paul Flowers, Richard Langely, William R. Robinson, Klaus Hellmut Theopold, 2019-02-14 Chemistry 2e is designed to meet the scope and sequence requirements of the two-semester general chemistry course. The textbook provides an important opportunity for students to learn the core concepts of chemistry and understand how those concepts apply to their lives and the world around them. The book also includes a number of innovative features, including interactive exercises and real-world applications, designed to enhance student learning. The second edition has been revised to incorporate clearer, more current, and more dynamic explanations, while maintaining the same organization as the first edition. Substantial improvements have been made in the figures, illustrations, and example exercises that support the text narrative. Changes made in Chemistry 2e are described in the preface to help instructors transition to the second edition.

biological classification pogil: Reconstructing the Tree of Life Trevor R. Hodkinson, John A.N. Parnell, 2006-12-26 To document the world's diversity of species and reconstruct the tree of life we need to undertake some simple but mountainous tasks. Most importantly, we need to tackle species rich groups. We need to collect, name, and classify them, and then position them on the tree of life. We need to do this systematically across all groups of organisms and b

biological classification pogil: Protists and Fungi Gareth Editorial Staff, 2003-07-03 Explores the appearance, characteristics, and behavior of protists and fungi, lifeforms which are neither plants nor animals, using specific examples such as algae, mold, and mushrooms.

biological classification pogil: Do Species Exist? Werner Kunz, 2013-08-02 A readily comprehensible guide for biologists, field taxonomists and interested laymen to one of the oldest problems in biology: the species problem. Written by a geneticist with extensive experience in field taxonomy, this practical book provides the sound scientific background to the problems arising with classifying organisms according to species. It covers the main current theories of specification and gives a number of examples that cannot be explained by any single theory alone.

biological classification pogil: *Taxonomy* Richard E. Blackwelder, 1967

biological classification pogil: A Synoptic Classification of Living Organisms Richard Stephen Kent Barnes, 1984-01

biological classification pogil: Bibliography of Polychaeta: Volume 1 ,

biological classification pogil: Molecular Biology of the Cell , 2002

biological classification pogil: Introduction to the Principles of Plant Taxonomy V. V. Sivarajan, 1991-08-30 A revised and fully updated edition encourages the reader to view existing classification systems objectively as it reflects upon the rapid advances that have occurred since the first edition's publication.

biological classification pogil: Teaching at Its Best Linda B. Nilson, 2010-04-20 Teaching at Its Best This third edition of the best-selling handbook offers faculty at all levels an essential toolbox

of hundreds of practical teaching techniques, formats, classroom activities, and exercises, all of which can be implemented immediately. This thoroughly revised edition includes the newest portrait of the Millennial student; current research from cognitive psychology; a focus on outcomes maps; the latest legal options on copyright issues; and how to best use new technology including wikis, blogs, podcasts, vodcasts, and clickers. Entirely new chapters include subjects such as matching teaching methods with learning outcomes, inquiry-guided learning, and using visuals to teach, and new sections address Felder and Silverman's Index of Learning Styles, SCALE-UP classrooms, multiple true-false test items, and much more. Praise for the Third Edition of *Teaching at Its Best* Everyone veterans as well as novices will profit from reading *Teaching at Its Best*, for it provides both theory and practical suggestions for handling all of the problems one encounters in teaching classes varying in size, ability, and motivation. Wilbert McKeachie, Department of Psychology, University of Michigan, and coauthor, *McKeachie's Teaching Tips* This new edition of Dr. Nilson's book, with its completely updated material and several new topics, is an even more powerful collection of ideas and tools than the last. What a great resource, especially for beginning teachers but also for us veterans! L. Dee Fink, author, *Creating Significant Learning Experiences* This third edition of *Teaching at Its Best* is successful at weaving the latest research on teaching and learning into what was already a thorough exploration of each topic. New information on how we learn, how students develop, and innovations in instructional strategies complement the solid foundation established in the first two editions. Marilla D. Svinicki, Department of Psychology, The University of Texas, Austin, and coauthor, *McKeachie's Teaching Tips*

biological classification pogil: *A Demo a Day* Borislav Bilash, George R. Gross, John K. Koob, 1995-03-01

biological classification pogil: Transformed Cladistics, Taxonomy and Evolution N. R. Scott-Ram, 1990-03-30 This is an examination of the relationship between classification and evolutionary theory, with reference to the competing schools of taxonomic thinking. Emphasis is placed on one of these schools, the transformed cladists who have attempted to reject all evolutionary thinking in classification and to cast doubt on evolution in general. The author examines the limits to this line of thought from a philosophical and methodological perspective. He concludes that transformed cladistics does not achieve what it claims and that it either implicitly assumes a Platonic World View, or is unintelligible without taking into account evolutionary processes--the very processes it claims to reject. Through this analysis the author attempts to formulate criteria of an objective and consistent nature that can be used to judge competing methodologies and theories. Philosophers of science, zoologists interested in taxonomy, and evolutionary biologists will find this a compelling study.

biological classification pogil: *Teaching and Learning STEM* Richard M. Felder, Rebecca Brent, 2024-03-19 The widely used STEM education book, updated *Teaching and Learning STEM: A Practical Guide* covers teaching and learning issues unique to teaching in the science, technology, engineering, and math (STEM) disciplines. Secondary and postsecondary instructors in STEM areas need to master specific skills, such as teaching problem-solving, which are not regularly addressed in other teaching and learning books. This book fills the gap, addressing, topics like learning objectives, course design, choosing a text, effective instruction, active learning, teaching with technology, and assessment—all from a STEM perspective. You'll also gain the knowledge to implement learner-centered instruction, which has been shown to improve learning outcomes across disciplines. For this edition, chapters have been updated to reflect recent cognitive science and empirical educational research findings that inform STEM pedagogy. You'll also find a new section on actively engaging students in synchronous and asynchronous online courses, and content has been substantially revised to reflect recent developments in instructional technology and online course development and delivery. Plan and deliver lessons that actively engage students—in person or online Assess students' progress and help ensure retention of all concepts learned Help students develop skills in problem-solving, self-directed learning, critical thinking, teamwork, and communication Meet the learning needs of STEM students with diverse backgrounds and identities

The strategies presented in Teaching and Learning STEM don't require revolutionary time-intensive changes in your teaching, but rather a gradual integration of traditional and new methods. The result will be a marked improvement in your teaching and your students' learning.

biological classification pogil: *The Poverty of the Linnaean Hierarchy* Marc Ereshefsky, 2000-11-27 The question of whether biologists should continue to use the Linnaean hierarchy has been a hotly debated issue. Invented before the introduction of evolutionary theory, Linnaeus's system of classifying organisms is based on outdated theoretical assumptions, and is thought to be unable to provide accurate biological classifications. Marc Ereshefsky argues that biologists should abandon the Linnaean system and adopt an alternative that is more in line with evolutionary theory. He traces the evolution of the Linnaean hierarchy from its introduction to the present. He illustrates how the continued use of this system hampers our ability to classify the organic world, and then goes on to make specific recommendations for a post-Linnaean method of classification. Accessible to a wide range of readers by providing introductory chapters to the philosophy of classification and the taxonomy of biology, the book will interest both scholars and students of biology and the philosophy of science.

biological classification pogil: *Temperature-Dependent Sex Determination in Vertebrates* Nicole Valenzuela, Valentine A. Lance, 2004 Edited by the world's foremost authorities on the subject, with essays by leading scholars in the field, this work shows how the sex of reptiles and many fish is determined not by the chromosomes they inherit but by the temperature at which incubation takes place.

biological classification pogil: *Describing Species* Judith E. Winston, 1999 A basic practical manual for the process of describing new species, this desperately needed desk reference and guide to nomenclatural procedure and taxonomic writing serves as a Strunk & White of species description, covering both botanical and zoological codes of nomenclature.

biological classification pogil: *The Oxford Handbook of Undergraduate Psychology Education* Dana S. Dunn, 2015-08-07 The Oxford Handbook of Undergraduate Psychology Education is dedicated to providing comprehensive coverage of teaching, pedagogy, and professional issues in psychology. The Handbook is designed to help psychology educators at each stage of their careers, from teaching their first courses and developing their careers to serving as department or program administrators. The goal of the Handbook is to provide teachers, educators, researchers, scholars, and administrators in psychology with current, practical advice on course creation, best practices in psychology pedagogy, course content recommendations, teaching methods and classroom management strategies, advice on student advising, and administrative and professional issues, such as managing one's career, chairing the department, organizing the curriculum, and conducting assessment, among other topics. The primary audience for this Handbook is college and university-level psychology teachers (at both two and four-year institutions) at the assistant, associate, and full professor levels, as well as department chairs and other psychology program administrators, who want to improve teaching and learning within their departments. Faculty members in other social science disciplines (e.g., sociology, education, political science) will find material in the Handbook to be applicable or adaptable to their own programs and courses.

biological classification pogil: *Education for Life and Work* National Research Council, Division of Behavioral and Social Sciences and Education, Board on Science Education, Board on Testing and Assessment, Committee on Defining Deeper Learning and 21st Century Skills, 2013-01-18 Americans have long recognized that investments in public education contribute to the common good, enhancing national prosperity and supporting stable families, neighborhoods, and communities. Education is even more critical today, in the face of economic, environmental, and social challenges. Today's children can meet future challenges if their schooling and informal learning activities prepare them for adult roles as citizens, employees, managers, parents, volunteers, and entrepreneurs. To achieve their full potential as adults, young people need to develop a range of skills and knowledge that facilitate mastery and application of English,

mathematics, and other school subjects. At the same time, business and political leaders are increasingly asking schools to develop skills such as problem solving, critical thinking, communication, collaboration, and self-management - often referred to as 21st century skills. Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century describes this important set of key skills that increase deeper learning, college and career readiness, student-centered learning, and higher order thinking. These labels include both cognitive and non-cognitive skills- such as critical thinking, problem solving, collaboration, effective communication, motivation, persistence, and learning to learn. 21st century skills also include creativity, innovation, and ethics that are important to later success and may be developed in formal or informal learning environments. This report also describes how these skills relate to each other and to more traditional academic skills and content in the key disciplines of reading, mathematics, and science. Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century summarizes the findings of the research that investigates the importance of such skills to success in education, work, and other areas of adult responsibility and that demonstrates the importance of developing these skills in K-16 education. In this report, features related to learning these skills are identified, which include teacher professional development, curriculum, assessment, after-school and out-of-school programs, and informal learning centers such as exhibits and museums.

biological classification pogil: Lizards in an Evolutionary Tree Jonathan B. Losos, 2011-02-09 In a book both beautifully illustrated and deeply informative, Jonathan Losos, a leader in evolutionary ecology, celebrates and analyzes the diversity of the natural world that the fascinating anoline lizards epitomize. Readers who are drawn to nature by its beauty or its intellectual challenges—or both—will find his book rewarding.—Douglas J. Futuyma, State University of New York, Stony Brook This book is destined to become a classic. It is scholarly, informative, stimulating, and highly readable, and will inspire a generation of students.—Peter R. Grant, author of *How and Why Species Multiply: The Radiation of Darwin's Finches* Anoline lizards experienced a spectacular adaptive radiation in the dynamic landscape of the Caribbean islands. The radiation has extended over a long period of time and has featured separate radiations on the larger islands. Losos, the leading active student of these lizards, presents an integrated and synthetic overview, summarizing the enormous and multidimensional research literature. This engaging book makes a wonderful example of an adaptive radiation accessible to all, and the lavish illustrations, especially the photographs, make the anoles come alive in one's mind.—David Wake, University of California, Berkeley This magnificent book is a celebration and synthesis of one of the most eventful adaptive radiations known. With disarming prose and personal narrative Jonathan Losos shows how an obsession, beginning at age ten, became a methodology and a research plan that, together with studies by colleagues and predecessors, culminated in many of the principles we now regard as true about the origins and maintenance of biodiversity. This work combines rigorous analysis and glorious natural history in a unique volume that stands with books by the Grants on Darwin's finches among the most informed and engaging accounts ever written on the evolution of a group of organisms in nature.—Dolph Schluter, author of *The Ecology of Adaptive Radiation*

biological classification pogil: Perspectives on Biodiversity National Research Council, Division on Earth and Life Studies, Commission on Life Sciences, Committee on Noneconomic and Economic Value of Biodiversity, 1999-10-01 Resource-management decisions, especially in the area of protecting and maintaining biodiversity, are usually incremental, limited in time by the ability to forecast conditions and human needs, and the result of tradeoffs between conservation and other management goals. The individual decisions may not have a major effect but can have a cumulative major effect. *Perspectives on Biodiversity* reviews current understanding of the value of biodiversity and the methods that are useful in assessing that value in particular circumstances. It recommends and details a list of components-including diversity of species, genetic variability within and among species, distribution of species across the ecosystem, the aesthetic satisfaction derived from diversity, and the duty to preserve and protect biodiversity. The book also recommends that more

information about the role of biodiversity in sustaining natural resources be gathered and summarized in ways useful to managers. Acknowledging that decisions about biodiversity are necessarily qualitative and change over time because of the nonmarket nature of so many of the values, the committee recommends periodic reviews of management decisions.

biological classification pogil: *Discipline-Based Education Research* National Research Council, Division of Behavioral and Social Sciences and Education, Board on Science Education, Committee on the Status, Contributions, and Future Directions of Discipline-Based Education Research, 2012-08-27 The National Science Foundation funded a synthesis study on the status, contributions, and future direction of discipline-based education research (DBER) in physics, biological sciences, geosciences, and chemistry. DBER combines knowledge of teaching and learning with deep knowledge of discipline-specific science content. It describes the discipline-specific difficulties learners face and the specialized intellectual and instructional resources that can facilitate student understanding. Discipline-Based Education Research is based on a 30-month study built on two workshops held in 2008 to explore evidence on promising practices in undergraduate science, technology, engineering, and mathematics (STEM) education. This book asks questions that are essential to advancing DBER and broadening its impact on undergraduate science teaching and learning. The book provides empirical research on undergraduate teaching and learning in the sciences, explores the extent to which this research currently influences undergraduate instruction, and identifies the intellectual and material resources required to further develop DBER. Discipline-Based Education Research provides guidance for future DBER research. In addition, the findings and recommendations of this report may invite, if not assist, post-secondary institutions to increase interest and research activity in DBER and improve its quality and usefulness across all natural science disciplines, as well as guide instruction and assessment across natural science courses to improve student learning. The book brings greater focus to issues of student attrition in the natural sciences that are related to the quality of instruction. Discipline-Based Education Research will be of interest to educators, policy makers, researchers, scholars, decision makers in universities, government agencies, curriculum developers, research sponsors, and education advocacy groups.

biological classification pogil: *The Origin of Species by Means of Natural Selection, Or, The Preservation of Favored Races in the Struggle for Life* Charles Darwin, 1896

biological classification pogil: *The New Taxonomy* Quentin D. Wheeler, 2008-04-09 Finalist for 2009 The Council on Botanical & Horticultural Libraries Literature Award! A Fresh Look at Taxonomy The most fundamental of all biological sciences, taxonomy underpins any long term strategies for reconstructing the great tree of life or salvaging as much biodiversity as possible. Yet we are still unable to say with any certainty how

biological classification pogil: *Chemistry 2e* Paul Flowers, Klaus Theopold, Richard Langley, Edward J. Neth, William R. Robinson, 2019-02-14 Chemistry 2e is designed to meet the scope and sequence requirements of the two-semester general chemistry course. The textbook provides an important opportunity for students to learn the core concepts of chemistry and understand how those concepts apply to their lives and the world around them. The book also includes a number of innovative features, including interactive exercises and real-world applications, designed to enhance student learning. The second edition has been revised to incorporate clearer, more current, and more dynamic explanations, while maintaining the same organization as the first edition. Substantial improvements have been made in the figures, illustrations, and example exercises that support the text narrative. Changes made in Chemistry 2e are described in the preface to help instructors transition to the second edition.

biological classification pogil: *Barriers and Opportunities for 2-Year and 4-Year STEM Degrees* National Academies of Sciences, Engineering, and Medicine, National Academy of Engineering, Policy and Global Affairs, Board on Higher Education and Workforce, Division of Behavioral and Social Sciences and Education, Board on Science Education, Committee on Barriers and Opportunities in Completing 2-Year and 4-Year STEM Degrees, 2016-05-18 Nearly 40 percent of the students entering 2- and 4-year postsecondary institutions indicated their intention to major in

science, technology, engineering, and mathematics (STEM) in 2012. But the barriers to students realizing their ambitions are reflected in the fact that about half of those with the intention to earn a STEM bachelor's degree and more than two-thirds intending to earn a STEM associate's degree fail to earn these degrees 4 to 6 years after their initial enrollment. Many of those who do obtain a degree take longer than the advertised length of the programs, thus raising the cost of their education. Are the STEM educational pathways any less efficient than for other fields of study? How might the losses be stemmed and greater efficiencies realized? These questions and others are at the heart of this study. *Barriers and Opportunities for 2-Year and 4-Year STEM Degrees* reviews research on the roles that people, processes, and institutions play in 2- and 4-year STEM degree production. This study pays special attention to the factors that influence students' decisions to enter, stay in, or leave STEM majors—quality of instruction, grading policies, course sequences, undergraduate learning environments, student supports, co-curricular activities, students' general academic preparedness and competence in science, family background, and governmental and institutional policies that affect STEM educational pathways. Because many students do not take the traditional 4-year path to a STEM undergraduate degree, *Barriers and Opportunities* describes several other common pathways and also reviews what happens to those who do not complete the journey to a degree. This book describes the major changes in student demographics; how students view, value, and utilize programs of higher education; and how institutions can adapt to support successful student outcomes. In doing so, *Barriers and Opportunities* questions whether definitions and characteristics of what constitutes success in STEM should change. As this book explores these issues, it identifies where further research is needed to build a system that works for all students who aspire to STEM degrees. The conclusions of this report lay out the steps that faculty, STEM departments, colleges and universities, professional societies, and others can take to improve STEM education for all students interested in a STEM degree.

biological classification pogil: *The Language of Science Education* William F. McComas, 2013-12-30 *The Language of Science Education: An Expanded Glossary of Key Terms and Concepts in Science Teaching and Learning* is written expressly for science education professionals and students of science education to provide the foundation for a shared vocabulary of the field of science teaching and learning. Science education is a part of education studies but has developed a unique vocabulary that is occasionally at odds with the ways some terms are commonly used both in the field of education and in general conversation. Therefore, understanding the specific way that terms are used within science education is vital for those who wish to understand the existing literature or make contributions to it. *The Language of Science Education* provides definitions for 100 unique terms, but when considering the related terms that are also defined as they relate to the targeted words, almost 150 words are represented in the book. For instance, “laboratory instruction” is accompanied by definitions for openness, wet lab, dry lab, virtual lab and cookbook lab. Each key term is defined both with a short entry designed to provide immediate access following by a more extensive discussion, with extensive references and examples where appropriate. Experienced readers will recognize the majority of terms included, but the developing discipline of science education demands the consideration of new words. For example, the term blended science is offered as a better descriptor for interdisciplinary science and make a distinction between project-based and problem-based instruction. Even a definition for science education is included. *The Language of Science Education* is designed as a reference book but many readers may find it useful and enlightening to read it as if it were a series of very short stories.

biological classification pogil: *BIO2010* National Research Council, Division on Earth and Life Studies, Board on Life Sciences, Committee on Undergraduate Biology Education to Prepare Research Scientists for the 21st Century, 2003-02-13 Biological sciences have been revolutionized, not only in the way research is conducted—with the introduction of techniques such as recombinant DNA and digital technology—but also in how research findings are communicated among professionals and to the public. Yet, the undergraduate programs that train biology researchers remain much the same as they were before these fundamental changes came on the scene. This new

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biological classification pogil: An Introduction to Plant Taxonomy Charles Jeffrey, 1982-08-19 This book explains in simple terms how plants are classified and named.

biological classification pogil: Principles of Biology Lisa Bartee, Walter Shiner, Catherine Creech, 2017 The Principles of Biology sequence (BI 211, 212 and 213) introduces biology as a scientific discipline for students planning to major in biology and other science disciplines. Laboratories and classroom activities introduce techniques used to study biological processes and provide opportunities for students to develop their ability to conduct research.

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