mass extinctions pogil

mass extinctions pogil is a key concept in understanding Earth’s biological history and the processes that have shaped life as we know it today. This article provides a comprehensive exploration of mass extinction events through the lens of Process Oriented Guided Inquiry Learning (POGIL), a student-centered instructional approach. Readers will gain insight into what mass extinctions are, their major causes, and their profound effects on biodiversity. We’ll discuss the five major mass extinctions, examine how POGIL activities can enhance understanding of these events, and highlight the importance of recognizing patterns and consequences of extinction. By delving into these topics, this guide aims to support educators, students, and enthusiasts in developing a deeper, analytical perspective on mass extinctions, while optimizing for search engines with relevant terminology. Read on to discover how mass extinctions pogil can illuminate Earth’s dynamic past and inform our understanding of the future.

Understanding Mass Extinctions

The term "mass extinctions pogil" refers to the study and exploration of mass extinction events using the POGIL approach. Mass extinctions are episodes in Earth's history when a significant, global decrease in biodiversity occurs over a relatively short geological timeframe. Typically, these events are marked by the rapid loss of at least 75% of species across various groups. Scientists use fossil records, geological data, and chemical signatures to identify and understand these events. By applying POGIL, students actively engage with data and models to unravel the complexity behind why and how these drastic biological turnovers happened.

Mass extinctions have fundamentally reshaped the evolutionary path of life on Earth. Each event triggered the disappearance of dominant species, opening ecological niches and paving the way for new groups to rise. Understanding the patterns, causes, and aftermath of mass extinctions is vital for grasping the dynamic nature of Earth's biosphere and the

resilience of life.

The Five Major Mass Extinction Events

Throughout Earth’s history, scientists recognize five major mass extinction events, often called "The Big Five." Each of these events is a focal point in mass extinctions pogil activities, helping learners connect geological processes with biological consequences. These events collectively transformed life on Earth, resulting in significant shifts in species composition and ecosystem structure.

Ordovician-Silurian Extinction

Approximately 444 million years ago, the Ordovician-Silurian extinction eliminated around 85% of all marine species. Triggered by severe climate change and glaciation, this event greatly affected marine life, especially organisms living in shallow seas.

Late Devonian Extinction

The Late Devonian extinction, occurring about 375 million years ago, saw a prolonged loss of species, particularly marine invertebrates and reef-building organisms. Environmental changes, such as anoxic events and fluctuating sea levels, contributed to this drawn-out crisis.

Permian-Triassic Extinction

Known as “The Great Dying,” the Permian-Triassic event 252 million years ago remains the most severe, wiping out over 90% of marine species and around 70% of terrestrial vertebrate species. Massive volcanic eruptions, climate shifts, and ocean anoxia are considered leading causes.

Triassic-Jurassic Extinction

Approximately 201 million years ago, the Triassic-Jurassic extinction paved the way for dinosaurs to dominate. Around 80% of species perished, likely due to volcanic activity, climate fluctuations, and possibly asteroid impacts.

Cretaceous-Paleogene (K-Pg) Extinction

The Cretaceous-Paleogene extinction, about 66 million years ago, is famous for ending the reign of non-avian dinosaurs. An asteroid impact, combined with volcanic activity and environmental stress, led to the loss of roughly 75% of species.

- Ordovician-Silurian Extinction (444 million years ago)
- Late Devonian Extinction (375 million years ago)
- Permian-Triassic Extinction (252 million years ago)
- Triassic-Jurassic Extinction (201 million years ago)
- Cretaceous-Paleogene Extinction (66 million years ago)

Causes and Consequences of Mass Extinctions

Exploring the causes behind mass extinctions pogil reveals a complex interplay of geological, climatic, and extraterrestrial factors. Each extinction event had unique triggers and consequences, but common themes emerge across the fossil record.

Primary Causes of Mass Extinctions

- Volcanic Eruptions: Massive outpourings of lava and gases can disrupt climates, causing acid rain and global cooling or warming.
- Asteroid Impacts: Collisions with extraterrestrial bodies release tremendous energy, triggering wildfires, tsunamis, and atmospheric changes.
- Climate Change: Rapid shifts in global temperatures, sea levels, or ocean chemistry can make habitats uninhabitable.
- Ocean Anoxia: Depletion of oxygen in oceans leads to large-scale marine die-offs.
- Sea Level Changes: Fluctuations expose or submerge vast habitats, displacing species.

Consequences of Mass Extinctions

The aftermath of mass extinctions is profound. Not only do they eliminate dominant species, but they also open ecological niches for new evolutionary innovations. Surviving

lineages diversify, leading to adaptive radiations and the emergence of novel forms. For example, after the Permian-Triassic extinction, reptiles diversified, eventually giving rise to dinosaurs. Each mass extinction thus resets the evolutionary stage, demonstrating the resilience and adaptability of life.

Exploring Mass Extinctions with POGIL

The POGIL (Process Oriented Guided Inquiry Learning) method is a collaborative, inquiry-based approach that actively engages students in the learning process. In the context of mass extinctions pogil, students analyze data, models, and scenarios related to past extinction events, fostering critical thinking and scientific reasoning.

POGIL Activity Structure

- Introduction to Mass Extinctions: Students review background information and key definitions.
- Data Analysis: Learners examine graphs, timelines, and fossil records to identify extinction patterns.
- Model Building: Groups construct models explaining causes and effects of extinction events.
- Collaborative Discussion: Teamwork encourages sharing ideas, questioning, and refining understanding.
- Application to Modern Issues: Students relate historical extinctions to current biodiversity concerns.

Benefits of POGIL for Mass Extinction Studies

POGIL activities support deeper understanding by guiding students through evidence-based reasoning. Instead of passively receiving information, learners discover concepts themselves, enhancing retention and transfer of knowledge. The collaborative nature of POGIL also builds communication and problem-solving skills, making it an effective tool for teaching complex topics like mass extinctions.

Learning Outcomes and Educational Benefits

Implementing mass extinctions pogil in educational settings offers numerous advantages

for both students and teachers. Through structured inquiry, participants achieve key learning outcomes while developing scientific literacy.

Key Learning Outcomes

- Understanding the definition and significance of mass extinctions.
- Identifying the five major extinction events and their characteristics.
- Analyzing primary causes and ecological consequences of extinction events.
- Developing skills in data interpretation and scientific reasoning.
- Applying historical lessons to contemporary environmental challenges.

Long-Term Educational Benefits

By engaging with mass extinctions pogil activities, students become adept at interpreting scientific data, recognizing patterns, and evaluating evidence. These skills are essential for success in STEM disciplines and for informed citizenship. Additionally, understanding mass extinctions fosters an appreciation for the dynamic nature of life on Earth and the importance of conservation in the face of ongoing biodiversity loss.

Patterns and Lessons from Mass Extinctions

Studying mass extinctions pogil helps reveal recurring patterns and vital lessons relevant to today’s world. Extinction events are not random—they result from identifiable causes, many of which are linked to environmental changes. Recognizing these patterns equips scientists and policymakers to anticipate and mitigate risks to modern biodiversity.

One key lesson is the interconnectedness of life and Earth’s systems. Disruptions in climate, atmosphere, or oceans can cascade through ecosystems, emphasizing the need for a holistic approach to environmental stewardship. By learning from past mass extinctions, society can better understand the consequences of rapid change and the value of maintaining ecological balance.

Frequently Asked Questions about Mass Extinctions POGIL

Q: What does the term "mass extinctions pogil" mean?

A: It refers to the study of mass extinction events using the Process Oriented Guided Inquiry Learning (POGIL) teaching method, which emphasizes collaborative, data-driven learning.

Q: How many major mass extinction events have occurred in Earth's history?

A: There have been five major mass extinction events, often referred to as "The Big Five," each with unique causes and impacts on global biodiversity.

Q: What are some of the primary causes of mass extinctions?

A: Primary causes include volcanic eruptions, asteroid impacts, rapid climate change, ocean anoxia, and sea level fluctuations.

Q: How does POGIL enhance student understanding of mass extinctions?

A: POGIL engages students in analyzing data, building models, and collaborating to uncover the causes and effects of mass extinctions, fostering deeper comprehension.

Q: Can mass extinctions pogil activities be applied to current environmental issues?

A: Yes, these activities help students connect historical extinction patterns to modern challenges such as biodiversity loss and climate change.

Q: Why is the Permian-Triassic extinction called "The Great Dying"?

A: Because it resulted in the most extensive loss of species in Earth's history, wiping out over 90% of marine species and 70% of terrestrial vertebrates.

Q: What skills do students develop through mass extinctions pogil activities?

A: Students build skills in scientific reasoning, data interpretation, teamwork, communication, and problem-solving.

Q: Are mass extinction events still relevant to today’s world?

A: Yes, understanding past extinctions helps inform conservation efforts and policy decisions to protect current biodiversity.

Q: What is the significance of the Cretaceous-Paleogene extinction?

A: It marks the end of the non-avian dinosaurs and allowed mammals to diversify and become the dominant land animals.

Q: How can educators implement mass extinctions pogil in the classroom?

A: Educators can use structured inquiry activities involving data analysis, model building, and collaborative discussion to teach about mass extinctions and their implications.

Mass Extinctions Pogil

Mass Extinctions POGIL: Unraveling Earth's Catastrophic Past

Have you ever wondered about the dramatic shifts in life on Earth, the moments when entire species vanished seemingly overnight? This blog post dives deep into the fascinating world of mass extinctions, specifically using the Problem-Oriented Guided Inquiry Learning (POGIL) approach to understand these catastrophic events. We'll explore the five major mass extinctions, their potential causes, and how POGIL activities can enhance your understanding of this crucial topic in geology and evolutionary biology. Get ready to unravel Earth's tumultuous past and develop critical thinking skills through interactive learning!

What are Mass Extinctions?

Mass extinctions represent periods in Earth's history characterized by significantly accelerated rates of species extinction exceeding the background extinction rate. These events are not just the disappearance of a few species; they represent the loss of a substantial portion of biodiversity, often impacting multiple ecosystems globally. While the exact definition varies, a general consensus considers a mass extinction event to involve the loss of at least 75% of existing species within a geologically short period.

The Big Five: Exploring the Major Mass Extinction Events

Earth has witnessed several mass extinctions throughout its history, but five stand out as particularly significant:

1. Ordovician-Silurian Extinction (443 million years ago):

This event, thought to be caused by a combination of glaciation and subsequent sea level changes, wiped out approximately 85% of species. The dramatic shift in climate significantly impacted marine life, leading to widespread extinctions.

2. Late Devonian Extinction (375 million years ago):

Occurring over a longer period, the Late Devonian extinction saw the loss of about 75% of all species. The causes remain debated, with potential contributors including asteroid impacts, volcanic activity, and climate change. This event particularly affected marine life, especially reefs.

3. Permian-Triassic Extinction (252 million years ago):

Famously known as the "Great Dying," this extinction event was the most severe in Earth's history, wiping out an estimated 96% of marine species and 70% of terrestrial vertebrates. The leading hypothesis points to massive volcanic eruptions in Siberia, releasing greenhouse gases and causing extreme global warming and ocean acidification.

4. Triassic-Jurassic Extinction (201 million years ago):

This extinction event paved the way for the rise of dinosaurs. The causes are less clear than other events, with possible contributors including volcanic activity, asteroid impacts, and gradual climate change. Around 80% of species went extinct.

5. Cretaceous-Paleogene Extinction (66 million years ago):

This event is perhaps the most famous, marking the end of the dinosaurs (non-avian). The prevailing scientific consensus attributes this extinction to an asteroid impact in the Yucatán Peninsula, causing widespread devastation through firestorms, tsunamis, and a prolonged "impact winter."

Using POGIL to Understand Mass Extinctions

POGIL activities provide a structured and engaging approach to learning about mass extinctions. Instead of passively receiving information, students actively participate in problem-solving and collaborative learning. This method enhances critical thinking skills and promotes deeper understanding. A typical POGIL activity might involve:

Analyzing data: Students may be presented with fossil records, geological data, or climate simulations to deduce the causes and consequences of specific extinction events.
Developing hypotheses: POGIL encourages students to formulate hypotheses about the factors contributing to mass extinctions and design experiments to test their ideas.
Evaluating evidence: Students critically assess different lines of evidence and consider the strengths and weaknesses of various hypotheses.
Collaborating and communicating: The collaborative nature of POGIL fosters discussion, debate, and shared understanding among students.

The Benefits of a POGIL Approach to Mass Extinctions

POGIL activities provide several advantages for students learning about mass extinctions:

Improved Comprehension: Active participation and problem-solving lead to deeper understanding than passive learning.
Enhanced Critical Thinking: Students develop crucial analytical and evaluative skills.
Increased Engagement: POGIL fosters a more engaging and stimulating learning environment.
Development of Collaboration Skills: Working in groups improves communication and teamwork abilities.
Scientific Reasoning: Students learn to apply scientific methods to investigate complex phenomena.

Conclusion

Mass extinctions are pivotal events in Earth's history, shaping the course of life and biodiversity. Understanding these events requires a multifaceted approach, and the POGIL methodology offers a powerful tool for developing critical thinking and a deeper understanding of the processes and consequences of these catastrophic events. By actively engaging with data and collaborating with peers, students can gain a more comprehensive and meaningful understanding of the complex interplay of factors that drive mass extinction and its lasting effects on our planet.

FAQs

1. What is the difference between background extinction and mass extinction? Background extinction refers to the continuous, low-level extinction of species that occurs naturally. Mass extinction, however, signifies a significantly accelerated rate of extinction affecting a large proportion of species over a geologically short period.

2. Are we currently experiencing a mass extinction event? Many scientists believe we are in the midst of a sixth mass extinction, driven by human activities such as habitat destruction, climate change, and pollution.

3. How can POGIL activities be adapted for different age groups? POGIL activities can be easily adapted by adjusting the complexity of the data and questions to suit the age and understanding of the students.

4. What are some examples of readily available POGIL activities on mass extinctions? While specific POGIL activities on mass extinctions aren't widely published as standalone resources, many educational institutions and resources design their own incorporating the POGIL methodology. Searching for "POGIL activities geology" or "POGIL activities extinction" will bring some useful results. You'll likely find examples within larger collections of earth science activities.

5. How can teachers find or create effective POGIL activities on mass extinctions? Teachers can adapt existing inquiry-based learning activities or design their own, focusing on specific aspects of mass extinctions like specific extinction events, their causes, or their consequences for ecosystems. Using online resources and collaborating with other educators are valuable approaches.

mass extinctions pogil: Mass Extinctions and Their Aftermath A. Hallam, P. B. Wignall, 1997-09-11 The first book to review all the evidence concerning both the dinosaur extinctions and all the other major extinctions - of plant, animal, terrestrial, and marine life - in the history of life. All the extinction mechanisms are critically assessed, including meteorite impact, anoxia, and volcanism. - ;Why do mass extinctions occur? The demise of the dinosaurs has been discussed exhaustively, but has never been out into the context of other extinction events. This is the first systematic review of the mass extinctions of all organisms, plant and animal, terrestrial and marine, that have occurred in the history of life. This includes the major crisis 250 million years ago which nearly wiped out all life on Earth. By examining current paleontological, geological, and sedimentological evidence of environmental changes, the cases for explanations based on climate change, marine regressions, asteroid or comet impact, anoxia, and volcanic eruptions are all critically evaluated. -

mass extinctions pogil: Catastrophes and Lesser Calamities Anthony Hallam, 2005-07-14 This is a book about the dramatic periods in the Earth's history called mass extinctions - short periods (by geological standards) when life nearly died out on Earth. The most famous is the mass extinction that happened about 65 million years ago, and that caused the death of the dinosaurs. But that was not the worst mass extinction: that honour goes to the extinction at the end of the Permian Period, about 250 million years ago, when over 90% of life is thought to have becomeextinct.What caused these catastrophes? Was it the effects of a massive meteorite impact? There is evidence for such an impact about 65 million years ago. Or was it a period of massive volcanic activity? There is evidence in the rocks of huge lava flows at periods that match several of the mass extinctions. Was it something to do with climate change and sea level? Or was it a combination of some or all of

these?The question has been haunting geologists for a number of years, and it forms one of the most exciting areas of research in geology today. In this book, Tony Hallam, a distinguished geologist and writer, looks at all the different theories and also what the study of mass extinctions might tell us about the future. If climate change is a key factor, we may well, as some scientists have suggested, be in a period of mass extinction of our own making.

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mass extinctions pogil: Extinction Michael Charles Boulter, 2002 Mikhail Gorbachev and Zdenek Mlynar were friends for half a century, since they first crossed paths as students in 1950. Although one was a Russian and the other a Czech, they were both ardent supporters of communism and socialism. One took part in laying the groundwork for and carrying out the Prague spring; the other opened a new political era in Soviet world politics. In 1993 they decided that their conversations might be of interest to others and so they began to tape-record them. This book is the product of that thinking out loud process. It is an absorbing record of two friends trying to explain to one another their views on the problems and events that determined their destinies. From reminiscences of their starry-eyed university days to reflections on the use of force to save socialism to contemplation of the end of the cold war, here is a far more candid picture of Gorbachev than we have ever seen before.

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Cretaceous that saw the end of the Dinosaurs; and minor mass extinctions from the early Cambrian the Cenozoic. Also examines the current paleontological, geological, and sedimentological evidence of environmental change; and sets out the cases for causes by climate change, marine regressions, asteroid or comet impact, anoxia, and volcanic eruptions. Annotation copyrighted by Book News, Inc., Portland, OR

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extinction. Brannen examines the fossil record—which is rife with creatures like dragonflies the size of sea gulls and guillotine-mouthed fish—and introduces us to the researchers on the front lines who, using the forensic tools of modern science, are piecing together what really happened at the crime scenes of the Earth's biggest whodunits. Part road trip, part history, and part cautionary tale, The Ends of the World takes us on a tour of the ways that our planet has clawed itself back from the grave, and casts our future in a completely new light.

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mass extinctions pogil: Under a Green Sky Peter Douglas Ward, 2007 More than 200 million years ago, a cataclysm known as the Permian extinction destroyed nearly 97 percent of all living things. Its origins have long been a puzzle. Paleontologist Ward, fresh from helping prove that an asteroid had killed the dinosaurs, turned to the Permian problem, and he has come to a stunning conclusion: that the near-total devastation at the end of the Permian period was caused by rising levels of carbon dioxide leading to climate change. The story of the discovery makes for a globe-spanning adventure. Here, Ward explains how the Permian extinction as well as four others happened, and describes the freakish oceans--belching poisonous gas--and sky--slightly green and always hazy--that would have attended them. Those ancient upheavals demonstrate that the threat of climate change cannot be ignored, lest the world's life today--ourselves included--face the same dire fate.--From publisher description.

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what mass extinctions are, cleverly comparing past extinctions with the one we are witnessing now. The two authors present us with a clear, intelligent, and lighthearted perspective on a fascinating phenomenon.

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mass extinctions pogil: *Under a Green Sky* Peter D. Ward, 2009-10-13 By looking backward at the course of great extinctions, a paleontologist sees what the future holds. More than 200 million years ago, a cataclysmic event known as the Permian extinction destroyed more than 90 percent of all species and nearly 97 percent of all living things. Its origins have long been a puzzle for paleontologists. During the 1990s and the early part of this century, a great battle was fought between those who thought that death had come from above and those who thought something more complicated was at work. Paleontologist Peter. D. Ward, fresh from helping prove that an asteroid had killed the dinosaurs, turned to the Permian problem, and he has come to a stunning conclusion. In his investigations of the fates of several groups of mollusks during that extinction and others, he discovered that the near-total devastation at the end of the Permian period was caused by rising levels of carbon dioxide leading to climate change. But it's not the heat (nor the humidity) that's directly responsible for the extinctions, and the story of the discovery of what is responsible makes for a fascinating, globe-spanning adventure. In Under a Green Sky, Ward explains how the Permian extinction as well as four others happened, and describes the freakish oceans—belching poisonous gas—and sky—slightly green and always hazy—that would have attended them. Those ancient upheavals demonstrate that the threat of climate change cannot be ignored, lest the world's life today—ourselves included—face the same dire fate that has overwhelmed our planet several times before.

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mass extinctions pogil: The Mass-Extinction Debates William Glen, 1994 This book examines the arguments and behavior of the scientists who have been locked in conflict over two competing theories to explain why, 65 million years ago, most life on earth—including the dinosaurs—perished.

mass extinctions pogil: When Life Nearly Died: The Greatest Mass Extinction of All Time (Revised edition) Michael J. Benton, 2015-08-11 “The focus is the most severe mass extinction known in earth’s history. The science on which the book is based is up-to-date, thorough,

and balanced. Highly recommended." —Choice Today it is common knowledge that the dinosaurs were wiped out by a meteorite impact 65 million years ago that killed half of all species then living. It is far less widely understood that a much greater catastrophe took place at the end of the Permian period 251 million years ago: at least ninety percent of life on earth was destroyed. When Life Nearly Died documents not only what happened during this gigantic mass extinction but also the recent renewal of the idea of catastrophism: the theory that changes in the earth's crust were brought about suddenly in the past by phenomena that cannot be observed today. Was the end-Permian event caused by the impact of a huge meteorite or comet, or by prolonged volcanic eruption in Siberia? The evidence has been accumulating, and Michael J. Benton gives his verdict at the end of the volume. The new edition brings the study of the greatest mass extinction of all time thoroughly up-to-date. In the twelve years since the book was originally published, hundreds of geologists and paleontologists have been investigating all aspects of how life could be driven to the brink of annihilation, and especially how life recovered afterwards, providing the foundations of modern ecosystems.

mass extinctions pogil: *Learner-Centered Teaching Activities for Environmental and Sustainability Studies* Loren B. Byrne, 2016-03-21 Learner-centered teaching is a pedagogical approach that emphasizes the roles of students as participants in and drivers of their own learning. Learner-centered teaching activities go beyond traditional lecturing by helping students construct their own understanding of information, develop skills via hands-on engagement, and encourage personal reflection through metacognitive tasks. In addition, learner-centered classroom approaches may challenge students' preconceived notions and expand their thinking by confronting them with thought-provoking statements, tasks or scenarios that cause them to pay closer attention and cognitively "see" a topic from new perspectives. Many types of pedagogy fall under the umbrella of learner-centered teaching including laboratory work, group discussions, service and project-based learning, and student-led research, among others. Unfortunately, it is often not possible to use some of these valuable methods in all course situations given constraints of money, space, instructor expertise, class-meeting and instructor preparation time, and the availability of prepared lesson plans and material. Thus, a major challenge for many instructors is how to integrate learner-centered activities widely into their courses. The broad goal of this volume is to help advance environmental education practices that help increase students' environmental literacy. Having a diverse collection of learner-centered teaching activities is especially useful for helping students develop their environmental literacy because such approaches can help them connect more personally with the material thus increasing the chances for altering the affective and behavioral dimensions of their environmental literacy. This volume differentiates itself from others by providing a unique and diverse collection of classroom activities that can help students develop their knowledge, skills and personal views about many contemporary environmental and sustainability issues.

mass extinctions pogil: Dying Planet Jon Erickson, 1991 What we need to know on a personal and societal level to reverse current trends for our planet.

mass extinctions pogil: Around the World in 80 Species Jill Atkins, Barry Atkins, 2018-11-08 The world is currently experiencing a sixth period of mass species extinction, and extinction of flora and fauna is caused by a variety of factors arising from industrial activity and increasing human population, such as global warming, climate change, habitat loss, pollution and use of pesticides. Most causes of extinction are linked to corporate activity, either directly or indirectly. Around the World in 80 Species: Exploring the Business of Extinction responds to the ongoing mass extinction crisis engulfing our planet by exploring the ways in which accounting, business and finance can be used to prevent species extinctions. From Africa to the Far East and from Europe to the Americas, the authors explore species loss and how businesses can stop mass extinctions through greater transparency, and through closer engagement with their investors and wildlife organisations. The book concludes that global capitalism has led us to this extinction crisis and that therefore the mechanisms of capitalism – namely accounting, finance, investment – can help to pull us out.

Businesses must urgently address extinction before it is too late for all species, including ourselves. As the first book to explore corporate accounting and accountability in relation to species on the brink of extinction, this book will be of great interest to both professionals and a wider audience interested in the causes and prevention of extinction.

mass extinctions pogil: The Worst of Times Paul B. Wignall, 2015-09-29 Unraveling the mystery of the catastrophic age of extinctions Two hundred sixty million years ago, life on Earth suffered wave after wave of cataclysmic extinctions, with the worst wiping out nearly every species on the planet. The Worst of Times delves into the mystery behind these extinctions and sheds light on the fateful role the primeval supercontinent, known as Pangea, might have played in causing these global catastrophes. Drawing on the latest discoveries as well as his own firsthand experiences conducting field expeditions to remote corners of the world, Paul Wignall reveals what scientists are only now beginning to understand about the most prolonged and calamitous period of environmental crisis in Earth's history. Wignall shows how these series of unprecedented extinction events swept across the planet, killing life on a scale more devastating than the dinosaur extinctions that would follow. The Worst of Times unravels one of the great enigmas of ancient Earth and shows how this ushered in a new age of vibrant and more resilient life on our planet.

mass extinctions pogil: The Miner's Canary Niles Eldredge, 2022-02-08 Like the bird whose death signaled dangerous conditions in a mine, the demise of animals that once flourished should give humans pause. How is our fate linked to the earth's creatures, and the cycle of flourishing and extinction? Which are the simple workings of nature's order, and which are omens of ecological disaster? Does human activity accelerate extinction? What really causes it? In an illuminating and elegantly written account of the widespread reduction of the world's wildlife, renowned paleontologist Niles Eldredge poses these questions and examines humankind's role in the larger life cycles of the earth, composing a provocative general theory of extinction.

mass extinctions pogil: Extinction P. B. Wignall, 2019 Extinction has occurred throughout the history of life, and nearly all the species that have ever existed have now disappeared. In this Very Short Introduction, Paul B. Wignall looks at the causes and nature of extinction events, what makes a species vulnerable, and the debates in modern science of the role of climate and humans.

mass extinctions pogil: Mass-Extinction Debates William Glen, 1994-11-01 The history of life on Earth is punctuated by half a dozen puzzling mass extinctions that constitute the benchmarks of the geologic time scale. These great breaks in the continuity of the fossil record have invited a wide array of scientific speculation. The most thoroughly studied of the mass extinctions occurred 65 million years ago when most life on Earth, incl. the dinosaurs, perished. Two rival hypotheses have emerged to account for this catastrophic event: the impactor hypothesis sees the earth bombarded with deadly meteorites, while the competing volcanist hypothesis evokes gigantic volcanic eruptions. This book examines the arguments and behavior of the scientists who have been locked in conflict over the competing hypotheses.

mass extinctions pogil: When Life Nearly Died Michael J. Benton, 2005-08-01 Documents the mass extinction of nearly 90 percent of life during the Permian period, discussing what caused the disaster and recent scientific research regarding catastrophic events.

mass extinctions pogil: Scatter, Adapt, and Remember Annalee Newitz, 2013-05-14 In its 4.5 billion–year history, life on Earth has been almost erased at least half a dozen times: shattered by asteroid impacts, entombed in ice, smothered by methane, and torn apart by unfathomably powerful megavolcanoes. And we know that another global disaster is eventually headed our way. Can we survive it? How? As a species, Homo sapiens is at a crossroads. Study of our planet’s turbulent past suggests that we are overdue for a catastrophic disaster, whether caused by nature or by human interference. It’s a frightening prospect, as each of the Earth’s past major disasters—from meteor strikes to bombardment by cosmic radiation—resulted in a mass extinction, where more than 75 percent of the planet’s species died out. But in Scatter, Adapt, and Remember, Annalee Newitz, science journalist and editor of the science Web site io9.com explains that although global disaster is all but inevitable, our chances of long-term species survival are better than ever. Life on Earth has

come close to annihilation—humans have, more than once, narrowly avoided extinction just during the last million years—but every single time a few creatures survived, evolving to adapt to the harshest of conditions. This brilliantly speculative work of popular science focuses on humanity's long history of dodging the bullet, as well as on new threats that we may face in years to come. Most important, it explores how scientific breakthroughs today will help us avoid disasters tomorrow. From simulating tsunamis to studying central Turkey's ancient underground cities; from cultivating cyanobacteria for "living cities" to designing space elevators to make space colonies cost-effective; from using math to stop pandemics to studying the remarkable survival strategies of gray whales, scientists and researchers the world over are discovering the keys to long-term resilience and learning how humans can choose life over death. Newitz's remarkable and fascinating journey through the science of mass extinctions is a powerful argument about human ingenuity and our ability to change. In a world populated by doomsday preppers and media commentators obsessively forecasting our demise, Scatter, Adapt, and Remember is a compelling voice of hope. It leads us away from apocalyptic thinking into a future where we live to build a better world—on this planet and perhaps on others. Readers of this book will be equipped scientifically, intellectually, and emotionally to face whatever the future holds.

mass extinctions pogil: *Mass Extinctions - Processes & Evidence* Stephen K. Donovan, 1991-09-29 Mass extinctions, the apparently sudden and regular disappearance of large numbers of species from the fossil record, are one of the mostly keenly contested and controversial debates in contemporary science. A great deal of research effort has gone into the topic and certain claims, notably that mass extinction eras display a periodicity of 24 million years, have caused great interest and disagreement.

mass extinctions pogil: The Sixth Extinction Elizabeth Kolbert, 2015 Over the last half a billion years, there have been five mass extinctions, when the diversity of life on earth suddenly and dramatically contracted. Scientists around the world are currently monitoring the sixth extinction, predicted to be the most devastating extinction event since the asteroid impact that wiped out the dinosaurs. But this time around, the cataclysm is us ... In The Sixth Extinction, two-time National Magazine award winner and New Yorker writer Elizabeth Kolbert draws on the work of scores of researchers in a half-dozen disciplines, accompanying many of them into the field: geologists who study deep ocean cores, botanists who follow the tree line as it climbs up the Andes, marine biologists who dive off the Great Barrier Reef. She introduces us to a dozen species, some already gone, others facing extinction, including the Panamian golden frog, staghorn coral, the Great Auk and the Sumatran rhino ... Through these stories, Kolbert provides a moving account of the disappearances occurring all around us and traces the evolution of extinction as a concept, from its first articulation by Georges Cuvier in French Revolutionary Paris through to the present day. The sixth extinction is likely to be mankind's most lasting legacy; as Kolbert observes, it compels us to rethink the fundamental question of what it means to be human.

mass extinctions pogil: *The End of Evolution* Peter Douglas Ward, 1995

mass extinctions pogil: *POGIL Activities for High School Biology* High School POGIL Initiative, 2012

mass extinctions pogil: The Call of Distant Mammoths Peter D. Ward, 2012-12-06 To help us understand what happened during the Ice Age, Peter Ward takes us on a tour of other mass extinctions through earth's history. He presents a compelling account of the great comet crash that killed off the dinosaurs, and describes other extinctions that were even more extensive. In so doing, he introduces us to a profound paradigm shift now taking place in paleontology: rather than arising from the gradual workings of everyday forces, all mass extinctions are due to unique, catastrophic events. Written with an irresistible combination of passion and expertise, The Call of Distant Mammoths is an engaging exploration of the history of life and the importance of humanity as an evolutionary force. Carefully argued...an intelligent and compelling book.-THE OLYMPIAN, SEATTLE, WASHINGTON Ward deftly summarizes a large body of scientific literature, simplifying complex ideas for the general reader without condescension.-PUBLISHERS WEEKLY Did the overkill

really happen?...Peter Ward deftly summarizes the arguments...Ward tells (the story) well.-THE NEW SCIENTIST

mass extinctions pogil: Aspects of Mass Extinctions Robert Garvey, 2024

mass extinctions pogil: *Major Events in the History of Life* J. William Schopf, 1992 Major Events in the History of Life, present six chapters that summarize our understanding of crucial events that shaped the development of the earth's environment and the course of biological evolution over some four billion years of geological time. The subjects are covered by acknowledged leaders in their fields span an enormous sweep of biologic history, from the formation of planet Earth and the origin of living systems to our earliest records of human activity. Several chapters present new data and new syntheses, or summarized results of new types of analysis, material not usually available in current college textbooks.