Mass extinction pogil

Mass extinction pogil is an engaging and educational activity designed to help students understand the complex phenomena of mass extinctions in Earth's history. Through guided inquiry and hands-on learning, a pogil (Process-Oriented Guided Inquiry Learning) approach fosters critical thinking, collaboration, and a deeper comprehension of how and why mass extinctions occur. This article explores the concept of mass extinctions, their causes, impacts, and the educational value of using pogil activities to study these significant events in Earth's biological history.

Understanding Mass Extinction Pogil: An Overview

Mass extinction pogil activities are structured lessons that encourage students to investigate the causes, effects, and patterns of mass extinctions. By engaging in this inquiry-based approach, learners develop a nuanced understanding of the Earth's history, the resilience of life, and the factors that can lead to catastrophic biological loss. What is a Pogil? A pogil (Process-Oriented Guided Inquiry Learning) is a student-centered teaching method that emphasizes active participation. It typically involves:

- Guided questions that lead students through key concepts. - Collaborative work to promote discussion and critical thinking. - Application of scientific principles to real-world phenomena. - Reflection and synthesis to consolidate understanding. Relevance to Studying Mass Extinctions Applying pogil strategies to mass extinction topics helps students: - Visualize complex processes. - Connect causes and consequences. - Develop scientific reasoning skills. - Appreciate the significance of extinction events in shaping life on Earth.

The Major Mass Extinction Events in Earth's History

Earth has experienced five major mass extinctions, each drastically reducing biodiversity and reshaping ecosystems. Understanding these events provides context for current biodiversity challenges and emphasizes the importance of conservation. The "Big Five" Mass Extinctions

1. End-Ordovician Extinction

- Occurred approximately 443 million years ago. - Estimated to have wiped out about 85% of marine species. - Major causes: - Global cooling and glaciation. - Drop in sea levels. - Impact: - Collapse of marine communities. - Resetting of evolutionary pathways.

2. Late Devonian Extinction

- Happened around 374 million years ago. - Loss of about 75% of species. - Possible causes: - Extensive volcanic activity. - Climate change. - Ocean anoxia (lack of oxygen). - Impact: - Extinction of many reef-building organisms. - Diversification of surviving groups.

3. End-Permian Extinction (The Great Dying)

- Occurred approximately 252 million years ago. - The most severe: up to 96% of marine species and 70% of terrestrial vertebrates went extinct. - Causes: - Massive volcanic eruptions (Siberian Traps). - Climate warming. - Ocean acidification. - Anoxia. - Impact: - Loss of nearly all trilobites and many other taxa. - Opening ecological niches for future evolution.

4. End-Triassic Extinction

- About 201 million years ago. - About 80% of species lost. - Causes: - Volcanic activity linked to the breakup of Pangaea. - Climate fluctuations. - Impact: - Extinction of many archosaurs. - Rise of dinosaurs.

5. End-Cretaceous Extinction (K-T

Event)

- Occurred around 66 million years ago. - Approximately 75% of species, including dinosaurs, went extinct. - Causes: - Impact of a large asteroid (Chicxulub crater). - Volcanic activity (Deccan Traps). - Climate change. - Impact: - Mass extinction of dinosaurs. - Rise of mammals.

Causes and Factors Leading to Mass Extinctions

Understanding the causes of mass extinctions is crucial for grasping the dynamics of Earth's biosphere. Pogil activities often guide students to explore these factors through inquiry and analysis. Natural Causes

1. **Volcanic Eruptions**: Large-scale eruptions release ash and gases, altering climate and ocean chemistry.
2. **Climate Change**: Rapid shifts in temperature and weather patterns can threaten species survival.
3. **Asteroid and Comet Impacts**: Impacts can cause massive wildfires, tsunamis, and atmospheric changes.
4. **Ocean Anoxia**: Lack of oxygen in oceans leads to die-offs of marine life.
5. **Sea-Level Fluctuations**: Changes in sea levels disrupt habitats.

Human-Induced Causes (for current and future

considerations) - Pollution - Habitat destruction - Climate change due to greenhouse gases - Overfishing and overhunting Interactions and Feedback Loops - Multiple causes often interact, amplifying the effects. - For example, volcanic eruptions can lead to climate warming or cooling, depending on gases released.

Impacts of Mass Extinctions on Earth's Biosphere

Mass extinctions are pivotal in shaping the trajectory of life on Earth. They cause widespread biodiversity loss but also open opportunities for new life forms to evolve. Immediate Effects - Rapid decrease in species diversity. - Collapse of existing ecosystems. - Loss of ecological functions such as pollination, predation, and nutrient cycling. Long-Term Effects - Evolutionary bottlenecks leading to reduced genetic diversity. - Extinction of dominant groups, allowing others to diversify. - Formation of new ecosystems and biogeographical patterns. Recovery and Evolution - After each mass extinction, biodiversity gradually recovers. - New species emerge, often filling ecological niches left vacant. - Examples include the rise of mammals after the extinction of dinosaurs.

Educational Strategies Using Pogil to Study Mass Extinction

Implementing pogil activities enhances student understanding of mass extinctions through active participation and inquiry. Here are some strategies: Designing a Mass Extinction Pogil - Begin with a question: What causes mass extinctions? - Use data analysis: Examine fossil records, extinction timelines, and environmental data. - Encourage hypothesis formation: What factors contributed to specific extinction events? - Promote analysis: Evaluate evidence linking causes and effects. - Facilitate reflection: Summarize findings and connect to current biodiversity issues. Sample Activities

1. **Timeline Analysis:** Map out extinction events and analyze concurrent environmental changes.
2. **Cause-and-Effect Charts:** Create diagrams linking volcanic activity, climate change, and extinction severity.
3. **Comparative Studies:** Compare two extinction events to identify common patterns and differences.
4. **Simulation Games:** Model ecosystem responses to environmental stressors.

Benefits of Pogil in STEM Education - Builds critical thinking and analytical skills. - Encourages collaborative learning. - Enhances retention through active engagement. - Prepares students for scientific research

and inquiry.

Current Relevance and Conservation Lessons

Studying past mass extinctions through pogil activities also offers valuable lessons for current environmental challenges. Recognizing Human Impact - Understanding how previous natural causes led to extinctions informs how human activities today may cause similar or greater impacts. - Recognizes the importance of mitigating climate change, pollution, and habitat destruction. Promoting Biodiversity Conservation - Appreciating Earth's history emphasizes the value of preserving current biodiversity. - Inspires stewardship and responsible environmental practices. Preparing Future Scientists and Citizens - Educating students about mass extinctions fosters environmental awareness. - Encourages critical thinking about sustainability and resilience.

Conclusion

Mass extinction pogil activities serve as vital educational tools that deepen understanding of Earth's history, environmental processes, and the importance of biodiversity. By exploring the causes, effects, and patterns of past mass extinctions, students develop

scientific literacy and a sense of responsibility toward current and future ecological challenges. Incorporating pogil strategies into science education not only makes learning engaging but also equips learners with the skills necessary to address complex environmental issues, ensuring that the lessons from Earth's past inform actions for a sustainable future.

Mass Extinction Pogil: A Comprehensive Review Understanding Earth's history requires delving into its most dramatic and transformative events—mass extinctions. The Mass Extinction Pogil (Process-Oriented Guided Inquiry Learning) is an educational tool designed to deepen students' understanding of these pivotal moments in Earth's biological history. By integrating inquiry-based learning strategies, it aims to foster critical thinking, collaborative problem-solving, and a comprehensive grasp of the causes, effects, and significance of mass extinctions. In this review, we will explore the structure, features, benefits, and potential limitations of the Mass Extinction Pogil, providing educators and students with a detailed overview of its value in science education.

What is the Mass Extinction Pogil?

The Mass Extinction Pogil is a structured activity worksheet built around the pedagogical framework of

Process-Oriented Guided Inquiry Learning. It is designed to guide students through the complex topic of mass extinctions, encouraging them to analyze data, interpret scientific evidence, and synthesize their understanding of Earth's history. Typically, the Pogil involves a series of interconnected questions, diagrams, and activities that prompt students to explore: - The timeline of Earth's major extinction events - The causes and consequences of these events - The evidence supporting various extinction theories - The broader impact on evolution and biodiversity This approach shifts the focus from passive reception of information to active engagement, making the learning process more meaningful and memorable.

Structure and Content of the Mass Extinction Pogil

The Mass Extinction Pogil generally follows a logical sequence designed to scaffold student understanding: 1. Introduction to Extinction Concepts Students begin by defining extinction and understanding its natural occurrence. They differentiate between background extinction rates and mass extinctions. 2. Timeline of Major Extinction Events Using timelines and fossils, students identify key events such as the Permian-Triassic extinction and the Cretaceous-Paleogene extinction, analyzing their timing and severity. 3. Causes of Mass Extinctions Students investigate various hypotheses,

including volcanic activity, asteroid impacts, climate change, and ocean anoxia, evaluating the evidence supporting each. 4. Evidence and Data Interpretation Activities often involve analyzing fossil records, isotopic data, and geological layers to interpret the causes and effects of extinctions. 5. Impacts on Biodiversity and Evolution Students explore how extinctions have shaped the course of evolution, including the rise of new species and the loss of others. 6. Human Influence and Future Risks The Pogil may conclude with discussions on human activities contributing to current biodiversity loss and the potential for future mass extinctions. Each section employs questions that promote critical thinking, data analysis, and synthesis, culminating in a comprehensive understanding of the topic.

Features and Educational Benefits

The Mass Extinction Pogil offers several features that enhance science education: Interactive and Student-Centered Learning - Promotes active engagement rather than passive listening. - Encourages collaboration among students to solve problems and discuss interpretations. Development of Scientific Skills - Data analysis: Interpreting fossil records, isotopic data, and geological evidence. - Critical thinking: Evaluating hypotheses and weighing evidence. - Communication: Explaining concepts and findings clearly. Flexibility and Adaptability - Can be tailored to different educational levels, from high

school to introductory college courses. - Compatible with various teaching formats, including in-class, remote, or hybrid learning. Conceptual Clarity - Breaks down complex ideas into manageable questions. - Uses visual aids such as diagrams, timelines, and data tables to reinforce understanding. Encourages Scientific Thinking - Emphasizes inquiry, evidence-based reasoning, and understanding of scientific processes.

Pros and Cons of the Mass Extinction Pogil

While the Mass Extinction Pogil is a valuable educational resource, it is important to consider its strengths and limitations: Pros: - Engages students actively in the learning process. - Develops critical scientific skills such as data interpretation and hypothesis evaluation. - Fosters collaboration and discussion among students. - Provides a structured yet flexible framework adaptable to various curricula. - Enhances understanding of Earth's history and the significance of mass extinctions. - Encourages application of concepts to real-world issues, such as current biodiversity crises. Cons: - Requires prior foundational knowledge in geology, ecology, and evolutionary biology. - May be time-consuming due to its detailed nature. - Relies heavily on student participation; less effective if students are disengaged. - Potentially limited in addressing diverse learning styles, especially if

not supplemented with other teaching methods. - Assessment challenges: Measuring individual understanding can be difficult if group work dominates.

Features That Make the Pogil Effective

The effectiveness of the Mass Extinction Pogil stems from several pedagogical features: - Inquiry-Based Approach: Encourages students to discover concepts through guided questions rather than passive listening. - Scaffolded Learning: Progressively builds understanding by connecting new information to prior knowledge. - Visual Aids and Data Analysis: Uses diagrams, timelines, and charts to make abstract concepts concrete. - Collaborative Environment: Promotes peer discussion, critical debate, and shared problem-solving. - Real Data Application: Incorporates actual scientific data, fostering authentic scientific reasoning. - Reflection Opportunities: Provides prompts for students to synthesize and articulate their understanding.

Implementing the Pogil in the Classroom

Effective integration of the Mass Extinction Pogil into teaching involves careful planning: - Preparation: Familiarize yourself with the activity's questions and data

sets. - Grouping: Organize students into small groups to facilitate discussion. - Guided Facilitation: Circulate, prompt critical thinking, and provide clarification when needed. - Assessment: Use formative assessments such as group presentations or individual reflections to gauge understanding. - Supplementary Materials: Incorporate videos, simulations, or lab activities to complement the Pogil. By embedding the Pogil into a broader curriculum, educators can reinforce core concepts and foster a lasting understanding of Earth's history.

Conclusion: Is the Mass Extinction Pogil Worth Using?

The Mass Extinction Pogil stands out as an effective, engaging, and educationally rich tool for teaching one of Earth's most fascinating and crucial topics. Its inquiry-based design promotes active learning, critical thinking, and a deeper appreciation of the processes that have shaped life on our planet. While it requires thoughtful implementation and student engagement, its benefits in developing scientific literacy and understanding make it a valuable addition to science education. For educators aiming to cultivate curiosity about Earth's history and the profound impact of mass extinctions, the Pogil offers a structured yet flexible approach that can transform abstract concepts into meaningful learning experiences. When combined with other pedagogical strategies, it can

significantly enhance students' understanding of evolution, geology, and environmental science—topics of enduring importance in a changing world.

Every reader approaches a book with different expectations. Some are searching for answers, others for guidance, and many simply want clarity. What makes the option to download *Mass Extinction Pogil* appealing is not only the content itself, but the way it adapts to these varied intentions without imposing a fixed path. Access becomes personal. A reader can open the book with a clear goal in mind, or with no plan at all. Both approaches work. There is no pressure to follow a strict order, no obligation to read everything at once. The material waits patiently, allowing engagement to unfold naturally. This sense of availability removes hesitation. When knowledge feels easy to reach, curiosity becomes more active. Readers explore topics they might otherwise postpone, trusting that they can pause, return, and revisit ideas whenever needed. Over time, this builds confidence and familiarity with the subject matter. Time plays a different role in this context. Learning does not demand long, uninterrupted hours. It fits into everyday moments. A few pages during a break, a short section before rest, or a quick review when a question arises all contribute to meaningful progress. Downloading *Mass Extinction Pogil* supports this rhythm without disrupting daily routines. Portability reinforces this experience. Instead of choosing one resource for one situation, readers carry access to

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available. Academic repositories expand this ecosystem by offering research and analysis that deepen context. Together, they support independent learning built on trust and reliability. Choosing legitimate sources remains essential. Trusted platforms protect readers from unreliable content and security risks while respecting intellectual contributions. Responsible access ensures that knowledge sharing remains sustainable for future learners. In professional environments, downloadable books serve as quiet resources. They are consulted when needed, revisited when questions arise, and relied upon for clarity. Instead of interrupting work, they integrate smoothly into ongoing tasks and decisions. Students experience similar flexibility. Learning adapts to individual pace and preference. Difficult sections can be revisited without pressure, and understanding develops gradually. The ability to study offline further supports focus and consistency. Different reading styles find equal support. Some readers prefer steady progression, others follow curiosity across sections. The format accommodates both, allowing each reader to shape their own path through *Mass Extinction Pogil*. Accessibility features extend participation. Adjustable text size, reading assistance tools, and compatibility with support technologies ensure that more people can engage comfortably. These features quietly expand access without altering content. Organization becomes intuitive. Digital libraries grow alongside interests and goals. Files

remain searchable, notes preserved, and insights easy to revisit. Learning feels cumulative rather than scattered. Another subtle advantage lies in reduced pressure. When readers know they can return at any time, they feel less urgency to understand everything immediately. Ideas settle through repetition and reflection, leading to deeper comprehension. Global availability adds perspective. Readers from different regions engage with the same material, often bringing varied interpretations. This shared access broadens understanding and highlights the value of multiple viewpoints. Exploration becomes natural when effort is minimal. Readers venture beyond familiar subjects, connecting ideas across disciplines. This openness strengthens creativity and encourages critical thinking. Long-term engagement is supported by continuity. Notes saved today remain relevant tomorrow. Bookmarks placed months ago still guide attention. Learning evolves instead of resetting. Books take on a different role. They become resources that wait rather than demand. They remain present, ready to support new questions and changing interests. Over time, this steady availability shapes attitude. Learning feels approachable. Curiosity feels justified. Understanding feels earned through consistency rather than urgency. Accessing *Mass Extinction Pogil* in this way aligns with real-life rhythms. It respects limited time, varied attention, and changing priorities. Learning becomes something that accompanies daily life rather than competing with it. Rather than

pushing toward a finish line, the experience encourages return. Each revisit brings new context and deeper insight. Familiar sections reveal new meaning as perspective shifts. Knowledge grows quietly through this process. There is no dramatic endpoint, only gradual accumulation. Ideas connect, understanding strengthens, and confidence develops naturally. In this space, learning does not announce itself. It unfolds through small choices, repeated engagement, and ongoing curiosity. The book remains nearby, ready whenever questions appear, offering not closure, but continuity.

Questions & Answers About mass extinction pogil

No	Question	Answer
1	What is the purpose of the 'Mass Extinction Pogil' activity?	The purpose is to help students understand the causes, effects, and patterns of mass extinctions in Earth's history through collaborative inquiry and analysis.
2	Which major mass extinction event is most commonly studied in Pogil activities?	The Permian-Triassic extinction event, also known as the Great Dying, is commonly studied due to its severity and impact on Earth's biodiversity.

3	How can Pogil activities help students understand the impact of environmental changes on mass extinctions?	Pogil activities encourage students to analyze data, make predictions, and understand the relationship between environmental factors and extinction events, fostering deeper comprehension through inquiry-based learning.
4	What are some key indicators scientists look for when studying past mass extinctions?	Scientists examine fossil records, isotopic data, changes in biodiversity, and geological layers to identify patterns and causes of mass extinctions.
5	How does the concept of 'trigger events' relate to mass extinctions in Pogil discussions?	Trigger events such as volcanic eruptions, asteroid impacts, or climate change are studied as potential causes that initiate rapid environmental changes leading to mass extinctions.
6	Why is understanding mass extinctions important for current biodiversity and environmental conservation?	Studying past extinctions helps us recognize patterns and causes, informing strategies to prevent or mitigate current biodiversity loss and environmental crises.
7	What skills do students develop through engaging with 'Mass Extinction Pogil' activities?	Students enhance critical thinking, data analysis, collaboration, and scientific reasoning skills while gaining a deeper understanding of Earth's history and extinction events.

mass extinction, pogil activities, extinction events, biodiversity loss, paleoecology, evolutionary biology, environmental science, extinction causes, fossil record, extinction timeline

Mass Extinction Pogil eBook Resource

Mass Extinction Pogil eBooks provide structured digital knowledge.

Core Discussion

Digital books help readers maintain productivity.

Practical Use

Mass Extinction Pogil eBooks support consistent study routines.

Conclusion

Digital reading improves access to information.

Many organizations incorporate Mass Extinction Pogil eBooks into internal training systems to ensure standardized knowledge transfer.

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Mass Extinction Pogil eBooks provide consistent

formatting that reduces cognitive load and improves reading flow.

Mass Extinction Pogil eBooks provide consistent formatting that reduces cognitive load and improves reading flow.

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Mass Extinction Pogil eBooks reduce reliance on fragmented online information.

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Advanced Tips

Advanced tips for managing and using Mass Extinction Pogil are essential for users who want to maximize efficiency, security, and flexibility when working with

digital documents. As collections grow and usage becomes more complex, understanding advanced techniques helps ensure that files remain optimized, accessible, and easy to manage across different devices and use cases.

One of the most important advanced practices is optimizing file size. Large PDF files can be difficult to share, slow to open, and consume unnecessary storage space. By compressing Mass Extinction Pogil files, users can significantly reduce file size without compromising readability or visual quality. Many professional PDF tools and online services offer intelligent compression that preserves text clarity, images, and layout while removing redundant data.

Another advanced technique involves securing sensitive content. If Mass Extinction Pogil contains proprietary, academic, or personal information, adding password protection can prevent unauthorized access. Passwords can restrict opening the file, printing, editing, or copying text. This is particularly useful when sharing documents in professional or collaborative environments where data protection is a priority.

Format conversion is also an advanced but practical strategy. Converting Mass Extinction Pogil PDFs into editable formats such as Word or Excel allows users to

revise content, extract data, or repurpose information for presentations and reports. After editing, files can be converted back to PDF to preserve formatting and compatibility. This workflow combines flexibility with consistency, making it ideal for research, education, and professional documentation.

Optimizing file performance

Beyond compression, users can improve performance by removing unnecessary pages, embedded fonts, or unused elements. Splitting large documents into smaller sections can also enhance navigation and reduce loading times, especially on mobile devices or older hardware.

Using Interactive Features

Modern editions of Mass Extinction Pogil increasingly include interactive features designed to improve engagement and learning outcomes. These features transform static documents into dynamic experiences that support deeper understanding and active participation. Interactive content is especially valuable for educational materials, training manuals, and technical guides.

Videos embedded within Mass Extinction Pogil can demonstrate concepts visually, making complex topics easier to grasp. Short explanatory clips, tutorials, or demonstrations complement written text and cater to

visual learners. Users should ensure that their PDF reader or eBook application supports multimedia playback to fully benefit from these features.

Quizzes and self-assessment tools are another powerful interactive element. They allow readers to test their understanding, reinforce key concepts, and identify areas that need further review. Interactive quizzes transform passive reading into active learning, improving retention and engagement.

Interactive diagrams and clickable illustrations enable users to explore content in greater detail. Zoomable charts, layered graphics, or clickable annotations provide additional context without overwhelming the main text. These elements are particularly useful in technical, scientific, or instructional versions of Mass Extinction Pogil.

Hyperlinks also play a crucial role in interactivity. Internal links improve navigation by connecting chapters, sections, or references, while external links direct users to supplementary resources. Effective use of hyperlinks creates a seamless reading experience and encourages further exploration of related topics.

Best practices for interactive content

To fully utilize interactive features, users should keep

their reading software updated. Compatibility issues can limit access to multimedia or interactive elements. Testing features across different devices ensures a consistent experience and prevents frustration during use.

Printing Tips

Despite the advantages of digital formats, printing Mass Extinction Pogil remains important for many users. Whether for study, annotation, or archival purposes, proper printing techniques ensure that the physical copy maintains the quality and structure of the original document.

Before printing, users should review page setup options carefully. Adjusting page size, orientation, and margins helps prevent content from being cut off or misaligned. Selecting the correct paper size is especially important for documents designed with specific layouts, such as textbooks or manuals.

Duplex printing is an effective way to reduce paper usage and create more compact documents. Printing on both sides of the paper not only saves resources but also makes large documents easier to handle and store. Many modern printers support automatic duplex printing, simplifying the process.

Print quality settings should be adjusted based on purpose. Draft mode is suitable for internal review or rough notes, while high-quality settings are better for final copies or professional presentations. Balancing quality and ink usage helps manage printing costs effectively.

For long documents, printing selected sections rather than the entire file can save time and resources. Using bookmarks or table of contents entries allows users to target specific chapters or pages, making printing more efficient and purposeful.

Binding and physical organization

After printing, organizing physical copies improves usability. Binding options such as spiral binding, folders, or binders keep pages secure and easy to reference. Labeling printed materials with titles and dates further enhances organization and long-term usability.

Advanced workflows and productivity

Integrating Mass Extinction Pogil into advanced workflows can significantly boost productivity. Combining digital annotation tools with note-taking applications creates a unified research or study environment. Syncing notes across devices ensures continuity and reduces duplication of effort.

Version control is another advanced practice worth adopting. When editing or updating Mass Extinction Pogil, maintaining clear version numbers and change logs prevents confusion and accidental overwriting. This is especially important in collaborative projects where multiple contributors are involved.

Automation tools can also streamline repetitive tasks. Batch conversion, bulk compression, or automated backups save time and reduce manual effort. Users managing large collections of digital documents benefit greatly from these efficiencies.

Balancing digital and physical use
Advanced users often combine digital and printed formats strategically. Digital copies offer portability, searchability, and interactivity, while printed versions provide tactile engagement and ease of annotation. Choosing the right format for each task maximizes effectiveness and comfort.

Security and long-term preservation
Protecting Mass Extinction Pogil goes beyond passwords. Regular backups, encryption, and secure storage practices ensure long-term preservation. Cloud services with version history and redundancy provide additional protection against data loss.

Archiving older versions in a separate location prevents clutter while preserving historical records. Clear labeling and documentation make archived files easy to retrieve if needed in the future.

Final thoughts on advanced usage of Mass Extinction Pogil

Mastering advanced tips for Mass Extinction Pogil empowers users to work more efficiently, securely, and creatively. From compression and security to interactive features and professional printing, these strategies enhance both digital and physical experiences. By adopting advanced workflows, leveraging interactivity, and maintaining organized storage, users can unlock the full potential of Mass Extinction Pogil in academic, professional, and personal contexts.