MYSTERY QUEST COLOR BY NUMBER ACTIVITY PUZZLE COL Printable PDF

Introduction to Mystery Quest Color by Number Activity Puzzle COL

Mystery quest color by number activity puzzle col is an engaging and immersive coloring activity designed to challenge and entertain individuals of all ages. Combining the elements of puzzle-solving with the relaxing art of coloring, this activity offers a unique way to stimulate both the mind and creativity. As players or participants embark on their mystery quest, they decipher clues, uncover hidden images, and bring intricate scenes to life through guided color palettes. This article explores the nuances of this captivating activity, examining its origins, benefits, features, and how to maximize enjoyment and educational value from it.

Understanding the Concept of Color by Number Activity Puzzles

What is a Color by Number Activity?

A color by number activity is a type of puzzle where each section of an image is marked with a number that corresponds to a specific color. Participants use a color key to fill in each segment with the designated hue, ultimately revealing a complete, vibrant picture. These activities are popular among children and adults alike because they combine artistic expression with structured guidance, making the process accessible and rewarding.

The Evolution into Mystery Quest Themes

While traditional color by number puzzles focus on straightforward images, the introduction of mystery quest themes elevates the experience. These themed puzzles incorporate elements of adventure, storytelling, and problem-solving, transforming a simple coloring task into an engaging journey. Participants become detectives or explorers, piecing together clues to unveil hidden images and narratives, which enhances cognitive engagement and emotional investment.

The Allure of Mystery Quest Color by Number Puzzles

Why Are They So Popular?

- **Interactive Experience:** Combines coloring with a story-driven quest, making the activity more immersive.

- **Cognitive Engagement:** Encourages critical thinking, pattern recognition, and problem-solving skills.
- **Stress Relief:** Provides a calming, meditative activity that reduces anxiety.
- **Educational Value:** Enhances fine motor skills, color recognition, and attention to detail.
- **Universal Appeal:** Suitable for various age groups, from children to adults.

The Unique Features of Mystery Quest Color by Number COL

The "COL" in this context typically refers to the collection or series of puzzle activities focused on mystery quests. These collections often feature:

- **Themed Scenes:** Environments like ancient temples, mystical forests, or haunted mansions.
- **Storyline Integration:** Short narratives that guide the coloring process, providing context and motivation.
- **Varied Difficulty Levels:** Ranging from simple images for beginners to complex scenes for advanced users.
- **Hidden Clues:** Elements within the images that, when colored, reveal clues or messages integral to the story.
- **High-Quality Artwork:** Detailed illustrations that challenge and inspire creativity.

Benefits of Engaging in Mystery Quest Color by Number Activity Puzzles

Enhancing Cognitive Skills

Participating in these puzzles stimulates various mental faculties:

- **Problem-Solving:** Deciphering clues and choosing appropriate colors require critical analysis.
- **Memory Improvement:** Remembering color codes and puzzle details enhances memory retention.
- **Attention to Detail:** Fine details in images demand concentration, improving focus.

Promoting Creativity and Artistic Expression

Despite the structured nature of color by number activities, they still foster personal artistic expression. Participants can experiment with different color schemes or add personal touches within the guidelines, making each completed puzzle unique.

Stress Relief and Mindfulness

The rhythmic process of coloring combined with the engaging story creates a meditative experience that reduces stress and promotes mindfulness. The sense of achievement upon completing a puzzle boosts confidence and overall well-being.

Educational Advantages

For younger participants, these puzzles serve as educational tools by:

- Improving fine motor skills through precise coloring.
- Teaching color recognition and differentiation.
- Introducing storytelling elements that enhance comprehension and sequencing skills.

How to Choose the Right Mystery Quest Color by Number COL

Factors to Consider

- **Age Appropriateness:** Select puzzles suitable for the participant's age and skill level.
- **Themed Interests:** Choose themes that align with personal interests like adventure, fantasy, or historical mysteries.
- **Difficulty Level:** Balance challenge and enjoyment by selecting puzzles that are neither too simple nor overly complex.
- **Quality of Artwork:** Opt for collections with detailed and well-designed illustrations.
- **Storyline Engagement:** Look for puzzles that offer compelling stories to enhance motivation.

Materials Needed

- Coloring tools such as colored pencils, markers, or crayons.
- Optional magnifying glass for intricate details.
- Printable or digital versions of puzzles, depending on preference.

Maximizing the Experience of Mystery Quest Color by Number COL

Tips for an Enjoyable and Productive Activity

- **Create a Relaxing Environment:** Find a quiet, comfortable space with good lighting.
- **Organize Your Materials:** Keep coloring tools within reach and sorted for easy access.
- **Follow the Story:** Read the storyline before starting to immerse yourself in the quest.

- **Take Breaks:** Avoid fatigue by taking short pauses, which also help maintain focus.
- **Experiment with Colors:** Feel free to deviate from the standard palette to add personal flair.
- **Share and Discuss:** Engage with friends or online communities to exchange tips and completed puzzles.

Incorporating the Puzzle into Learning and Recreation

These activities can be integrated into educational settings or recreational routines to foster teamwork, storytelling skills, and artistic development. Teachers and parents can create themed challenges or storytelling sessions based on completed puzzles to enhance cognitive and language skills.

Conclusion: The Enduring Appeal of Mystery Quest Color by Number Activity Puzzle COL

Mystery quest color by number activity puzzle col continues to captivate a broad audience due to its perfect blend of art, storytelling, and cognitive challenge. Whether used as a relaxing pastime, educational tool, or creative outlet, these puzzles offer a rewarding experience that stimulates the mind while nurturing artistic skills. As digital and print formats evolve, the accessibility and variety of these puzzles will likely expand, ensuring their place as a beloved activity for generations to come. Embracing this activity is not only an opportunity to unwind but also a chance to embark on exciting adventures without leaving the comfort of your home or classroom.

Mystery Quest Color By Number Activity Puzzle COL: Unlocking Creativity and Cognitive Skills through Color by Number Fun

Coloring activities have long been celebrated for their ability to foster relaxation, improve focus, and stimulate creativity across all age groups. Among the various types of coloring activities, the Mystery Quest Color By Number Activity Puzzle COL stands out as a captivating and intellectually stimulating experience. This innovative activity combines the classic appeal of color by number with the intrigue of mystery solving, offering an engaging way to enhance problem-solving skills, attention to detail, and artistic expression. Whether you're a parent seeking educational entertainment for children or an adult looking for a relaxing yet challenging pastime, this activity promises both fun and cognitive benefits.

What Is the Mystery Quest Color By Number Activity Puzzle COL?

The Mystery Quest Color By Number Activity Puzzle COL is a themed coloring puzzle that involves assigning colors to numbered sections within an image to reveal a hidden mystery or story. Unlike standard color by number sheets, this activity often includes a narrative element, encouraging participants to solve clues or follow a storyline as they progress through the puzzle. The goal is not

only to create a beautifully colored picture but also to engage in a mental adventure that sharpens observation and deductive reasoning skills.

This activity typically features vibrant illustrations crafted around adventure, detective, or fantasy themes, making it particularly appealing to children and adults who enjoy mystery stories and puzzle-solving. The "COL" in its name emphasizes the collaborative or collection aspect, implying that these puzzles may be part of a series or a collection of themed activities.

Benefits of Engaging with Mystery Quest Color By Number Puzzles

Participating in Mystery Quest Color By Number Activity Puzzle COL offers numerous advantages, including:

- Enhancement of Cognitive Skills: Solving clues and following sequences sharpens logical thinking and reasoning.
- Development of Fine Motor Skills: Precise coloring improves hand-eye coordination and dexterity.
- Boosting Focus and Patience: Completing detailed puzzles requires sustained attention and perseverance.
- Fostering Creativity: Choosing color schemes and bringing images to life nurtures artistic expression.
- Stress Relief and Relaxation: Immersing in a themed activity can be meditative and calming.
- Educational Value for Children: Reinforces number recognition, color theory, and storytelling.

How to Approach the Mystery Quest Color By Number Activity Puzzle COL

Approaching this activity with a strategic mindset can enhance both the enjoyment and the outcome. Here's a step-by-step guide:

- Select the Appropriate Puzzle

- Choose a puzzle that matches your skill level and interests.
- For beginners, start with simpler images with fewer color codes.
- For advanced users, opt for more complex puzzles with intricate details.

- Gather Your Supplies

- A good set of colored pencils, markers, or crayons.
- A comfortable workspace with good lighting.
- Optional: an eraser, sharpener, or blending tools for advanced coloring.

- Familiarize Yourself with the Clues

- Review the legend or key that associates numbers with specific colors.
- Understand the theme or story behind the puzzle to increase engagement.
- Note any special instructions, such as shading or blending techniques.

- Begin Coloring Methodically

- Start with the smallest or least detailed sections to build confidence.
- Follow the number guide carefully to ensure accuracy.
- Use a sharp pencil or fine-tipped coloring tools for precision.

- Solve the Puzzle's Mystery Elements

- As you color, pay attention to clues embedded in the artwork.
- Think critically about how colors and images relate to the storyline.
- Use deductive reasoning if the activity involves uncovering hints or solving riddles.

- Maintain Patience and Enjoy the Process

- Take breaks to avoid fatigue.
- Appreciate the transformation of the image as you progress.
- Celebrate small milestones, like completing a section or revealing a hidden element.

Tips for Maximizing the Experience

- Create a themed environment: Play background music or set a cozy space to immerse yourself fully.

- Collaborate or share: Invite friends or family to join the activity and discuss clues or story elements.
- Use a color palette: Pre-select colors to maintain harmony and reduce decision fatigue.
- Document your progress: Take photos or keep a journal of your journey through the mystery.

Exploring the Themed Variations of Mystery Quest Puzzles

Many Mystery Quest Color By Number Activity Puzzle COL collections feature diverse themes, each offering unique puzzles and narratives. Here are some popular variations:

- Detective Mysteries: Solve crimes or uncover hidden clues within detailed cityscapes, forests, or interiors.
- Fantasy Adventures: Color mythical creatures, enchanted landscapes, and heroic characters.
- Historical Mysteries: Discover ancient artifacts, castles, and legendary figures.
- Animal Expeditions: Unlock hidden animals and wildlife scenes with clues about their habitats.

Each theme not only provides visual enjoyment but also introduces educational elements related to history, nature, or storytelling.

Incorporating Educational and Therapeutic Aspects

The Mystery Quest Color By Number Activity Puzzle COL can be tailored for educational settings or therapy sessions:

- For Educators: Use themed puzzles to teach concepts like storytelling, sequencing, or cultural history.
- For Therapists: Employ the activity to improve fine motor skills or manage anxiety and stress.
- For Parents: Combine coloring with reading or puzzle-solving to create a multifaceted learning experience for children.

Final Thoughts: Unveiling the Joy of Mystery and Creativity

The Mystery Quest Color By Number Activity Puzzle COL offers a multifaceted approach to engaging with art, puzzles, and storytelling. It transforms a simple coloring activity into an adventure that stimulates the mind and nurtures creativity. Whether you're unraveling clues, designing a scene, or simply enjoying the calming process of coloring, this activity provides a rewarding experience for all ages.

By approaching it with curiosity and patience, participants can enjoy not only the visual gratification

of a beautifully colored picture but also the satisfaction of solving a mystery. So, gather your coloring tools, choose your favorite theme, and embark on your own mystery quest?one color at a time.

QuestionAnswer What is the 'Mystery Quest Color by Number Activity Puzzle Col' designed to improve? It helps enhance color recognition, fine motor skills, and cognitive problem-solving abilities in users. Is the 'Mystery Quest Color by Number' suitable for all age groups? Yes, it is suitable for children and adults, with varying complexity levels to accommodate different ages. Can I find special themes or characters in the 'Mystery Quest' puzzles? Absolutely! The puzzles often feature adventurous themes, mysterious characters, and vibrant scenes to engage users. What makes the 'Mystery Quest Color by Number' activity stand out from other coloring puzzles? Its engaging mystery storyline combined with color-by-number mechanics creates an immersive and educational experience. Are digital versions of the 'Mystery Quest Color by Number' puzzles available? Yes, many versions are available as downloadable PDFs or interactive apps for added convenience and interactivity. How does the activity promote relaxation and stress relief? The repetitive, focused coloring process helps calm the mind and reduce stress, making it a great relaxation activity. Can educators use 'Mystery Quest' puzzles in classroom settings? Yes, teachers often incorporate these puzzles into lessons to promote artistic skills, focus, and problem-solving among students. Are there different difficulty levels available in 'Mystery Quest Color by Number' puzzles? Yes, puzzles come in various difficulty levels, from simple designs for beginners to complex scenes for advanced colorists. What materials are needed to complete a 'Mystery Quest Color by Number' puzzle? Typically, you just need coloring tools like colored pencils, markers, or digital coloring apps, depending on the format.

Related keywords: mystery puzzle, color by number, activity sheet, coloring game, brain teaser, detective game, logic puzzle, fun activity, kids coloring, number coloring

POGIL THE ACTIVITY SERIES ANSWERS

pogil the activity series answers are an essential resource for students and educators seeking to understand the reactivity of metals and the principles behind chemical reactions. The POGIL (Process Oriented Guided Inquiry Learning) activity series is designed to foster active learning through guided inquiry, helping learners grasp complex concepts related to the activity series of metals. This article provides a comprehensive overview of the activity series, offers detailed answers to typical POGIL activities, and explains how understanding these answers can enhance your grasp of chemical reactivity and metal displacement reactions.

Understanding the Activity Series of Metals

What Is the Activity Series?

The activity series of metals is a ranked list that arranges metals based on their reactivity with other substances, especially acids and water. Metals higher in the series are more reactive and can displace metals lower in the series from their compounds. This concept is fundamental in predicting the outcomes of various chemical reactions involving metals.

Purpose of the Activity Series

- To predict whether a metal will react with acids or water.
- To determine the feasibility of displacement reactions.
- To understand the relative reactivity of different metals.
- To assist in identifying safe handling and storage of metals.

Commonly Used Reactivity Series

The activity series typically includes metals such as:

- Potassium (K)
- Sodium (Na)
- Calcium (Ca)
- Magnesium (Mg)
- Aluminum (Al)
- Zinc (Zn)
- Iron (Fe)
- Lead (Pb)
- Copper (Cu)
- Mercury (Hg)
- Silver (Ag)
- Gold (Au)

Key Concepts in POGIL Activities on the Activity Series

Displacement Reactions

Displacement reactions occur when a more reactive metal displaces a less reactive metal from its compound. For example:

- Zinc reacting with copper sulfate: Zn + CuSO? ? ZnSO? + Cu

Reactions with Water and Acids

Metals react differently depending on their position in the activity series:

- Highly reactive metals (e.g., potassium, sodium) react vigorously with water.
- Moderately reactive metals (e.g., zinc, iron) react slowly or not at all with water but react with acids.
- Less reactive metals (e.g., copper, silver) usually do not react with acids or water.

Corrosion and Protection

Understanding the activity series helps in preventing corrosion:

- Sacrificial protection involves placing a more reactive metal (like zinc) to protect less reactive metals (like iron).

Common POGIL Activity Series Questions and Answers

Question 1: Rank the following metals from most reactive to least reactive: magnesium, copper, zinc, and silver.

- Most reactive: Magnesium
- Zinc
- Copper
- Least reactive: Silver

Answer Explanation: Magnesium is higher in the activity series, meaning it reacts more readily with acids and water. Zinc is below magnesium but above copper and silver, which are much less reactive.

Question 2: Will zinc displace copper from copper sulfate? Explain your answer.

Answer: Yes, zinc will displace copper from copper sulfate because zinc is more reactive than copper according to the activity series. The reaction is:

- Zn + CuSO? ? ZnSO? + Cu

Question 3: Which metals will react with water? Provide examples from the activity series.

Answer: Metals above hydrogen in the activity series react with water:

- Potassium (K)
- Sodium (Na)
- Calcium (Ca)
- Magnesium (Mg)

Example: Sodium reacts vigorously with water:

- 2 Na + 2 H?O ? 2 NaOH + H?

Question 4: Why does gold not react with acids or water? Use the activity series to support your answer.

Answer: Gold is at the bottom of the activity series, indicating it has very low reactivity. Therefore, it does not react with acids or water because it is less reactive than hydrogen and cannot displace other elements from their compounds.

How to Use the Activity Series in Chemistry

Predicting Reactions

To predict if a displacement reaction will occur:

- Check the positions of the metals involved.
- If the metal you are adding is higher in the series than the metal in the compound, a reaction will likely occur.

Designing Experiments

- Select metals based on their position in the activity series.
- Observe reactions with acids, water, or other metal compounds.

- Record and analyze results to reinforce understanding.

Safety Considerations

- Highly reactive metals like potassium and sodium should be handled with care.
- Reactions involving these metals should be performed under supervision and with proper safety equipment.

Summary of Key Points for POGIL Activity Series Answers

- The activity series ranks metals based on reactivity.
- More reactive metals can displace less reactive metals from their compounds.
- Metals react differently with water and acids depending on their position.
- Gold and platinum are least reactive, often unreactive with acids and water.
- Understanding the activity series aids in predicting reactions, preventing corrosion, and designing chemical experiments.

Additional Tips for Mastering the Activity Series

Memorization Strategies

- Use mnemonic devices to remember the order of metals.
- Create flashcards with metal names and their positions.
- Practice predicting reactions regularly.

Real-World Applications

- Corrosion prevention in infrastructure.
- Metal extraction and refining processes.
- Designing batteries and electrochemical cells.
- Understanding environmental impacts of metal waste.

Practice Questions for Reinforcement

- Which metals can react with acids but not with water?
- How does the activity series explain the corrosion of iron?

- What is the significance of the activity series in recycling metals?

Conclusion

Understanding the **pogil the activity series answers** is fundamental to mastering concepts in chemistry related to metal reactivity. By exploring the principles behind the activity series, students can predict chemical reactions, understand displacement reactions, and appreciate the importance of metal reactivity in industrial processes and everyday life. Whether you're preparing for exams, conducting experiments, or simply seeking to deepen your understanding of chemistry, mastering the activity series through guided inquiry activities like POGIL can significantly enhance your knowledge and analytical skills.

Keywords: pogil activity series answers, metal reactivity, displacement reactions, activity series of metals, chemical reactivity, corrosion prevention, metal reactions with water, metal reactions with acids, POGIL activities, chemistry education

Pogil the Activity Series Answers: A Comprehensive Guide to Understanding and Using the Activity Series in Chemistry

Understanding the Pogil the Activity Series Answers is essential for students and educators who aim to master the concepts of reactivity in chemistry. The activity series, often presented in Pogil (Process Oriented Guided Inquiry Learning) activities, provides a systematic way to predict the outcomes of single replacement reactions and to understand the relative reactivity of metals and non-metals. This guide aims to demystify the activity series, explain how to interpret Pogil activities related to it, and provide strategies for mastering the answers effectively.

What is the Activity Series?

The activity series is a ranked list of elements (mainly metals) based on their ability to displace other elements from compounds, particularly in aqueous solutions. It helps chemists predict whether a certain single displacement reaction will proceed spontaneously.

Key Features of the Activity Series:

- Reactivity ranking: Elements are ordered from most reactive to least reactive.
- Displacement capability: More reactive metals can displace less reactive metals from their compounds.
- Standard reduction potentials: The series correlates with the elements' tendencies to gain electrons (be reduced).

The Role of Pogil Activities in Learning the Activity Series

Pogil activities are designed to facilitate inquiry-based learning. When applied to the activity series, these activities encourage students to analyze data, interpret trends, and develop reasoning skills related to chemical reactivity.

Typical Pogil Activity Structure:

- Initial exploration: Students observe and analyze experimental data or reaction patterns.
- Guided questions: Foster critical thinking about the relationships between element reactivity and their positions in the series.
- Application exercises: Students predict the outcomes of reactions based on the series and verify their reasoning.

How to Approach Pogil the Activity Series Activities

Mastering Pogil activities related to the activity series involves a strategic approach:

Step 1: Review the Activity Series Chart

Familiarize yourself with the standard activity series chart. Recognize the order of metals and how it relates to their reactivity.

Step 2: Understand Key Concepts

- Displacement reactions: Metal A displaces metal B if A is above B in the series.
- Reaction spontaneity: Reactions proceed spontaneously if the element doing the displacing is more reactive.

Step 3: Analyze Experimental Data

Look at the data provided in the activity:

- Which reactions occurred?
- Which did not?
- What patterns emerge?

Step 4: Answer Guided Questions Carefully

Reflect on the reasoning behind each answer:

- Why does a particular reaction happen or not?
- How does the position of an element in the series influence its reactivity?

Step 5: Practice with Variations

Try predicting the outcomes of reactions not explicitly covered in the activity to reinforce understanding.

Common Questions and Answer Strategies for Pogil the Activity Series

Below are typical questions encountered in Pogil activities and strategies for answering them effectively.

Question 1: Which metals can displace hydrogen from acids?

Answer approach:

- Refer to the activity series to identify metals above hydrogen.
- Metals like zinc, magnesium, and iron are above hydrogen and can displace it from acids.
- Metals below hydrogen (e.g., copper, silver) cannot.

Question 2: Why does a reaction occur between zinc and copper sulfate but not between copper and zinc sulfate?

Answer approach:

- Look at the position of zinc and copper in the activity series.
- Zinc is above copper, so zinc can displace copper from its sulfate.
- Copper is below zinc, so it cannot displace zinc from its sulfate.

Question 3: Predict whether a given reaction will occur.

Answer approach:

- Check the relative reactivity of the metals involved.

- Confirm whether the metal attempting to displace is higher in the activity series.

Tips for Mastering the Activity Series and Pogil Answers

- Memorize the basic activity series: While not always necessary to memorize the entire series, knowing the general order helps in quick reasoning.
- Understand the underlying principles: Recognize that the activity series is based on oxidation-reduction tendencies.
- Practice with real examples: Use textbook problems, online quizzes, and lab experiments to reinforce your understanding.
- Use visual aids: Create flashcards or charts to visualize the series.
- Discuss with peers or instructors: Clarify doubts and explore different reasoning approaches.

Real-World Applications of the Activity Series

Understanding the activity series extends beyond academic exercises and into practical applications:

- Corrosion prevention: Selecting appropriate metals for construction to prevent rust.
- Electrochemical cells: Designing batteries based on the reactivity of metals.
- Metal extraction: Choosing suitable metals for reduction processes.

Conclusion

Mastering Pogil the Activity Series Answers is a fundamental step toward understanding chemical reactivity and predicting reaction outcomes. By familiarizing yourself with the structure of the activity series, practicing interpretation of Pogil activities, and applying critical reasoning strategies, you will enhance your comprehension of oxidation-reduction processes. Remember, the activity series is more than just a list?it's a powerful tool that unlocks the predictive power of chemistry in both academic and real-world contexts.

Empower your chemistry learning journey by engaging deeply with Pogil activities and the activity series. With practice and understanding, you'll develop the confidence to analyze reactions critically and apply your knowledge effectively.

QuestionAnswer What is the purpose of the POGIL activity series activity? The purpose is to help students understand the reactivity of metals by arranging them in a activity series based on their ability to displace or react with other substances. How do I determine the position of a metal in the activity series using POGIL activities? You determine the position by analyzing experimental

results from displacement reactions and comparing how easily metals react with acids, water, or other solutions, as guided by the POGIL activity instructions. Are the answers to the POGIL activity series activity available online? Yes, various educational resources and teacher websites provide answer keys to POGIL activity series activities, but it's best to use them to understand concepts rather than just copying answers. What are common mistakes students make when completing the POGIL activity series activity? Common mistakes include misinterpreting experimental data, confusing the reactivity order of similar metals, or not following the experimental procedure carefully as outlined in the activity guide. How can I use the POGIL activity series to predict chemical reactions? By understanding the activity series, you can predict whether a metal will displace another from a compound or react with acids, based on their positions in the series. Is the POGIL activity series activity suitable for beginner chemistry students? Yes, it is designed to introduce students to the concept of reactivity and series of metals in a collaborative and inquiry-based manner suitable for beginners. Where can I find detailed answers or explanations for the POGIL activity series? You can find detailed explanations in teacher guides, educational websites, or textbooks that accompany the POGIL curriculum, and some online forums or study groups discuss these activities. How does understanding the activity series help in real-world applications? Understanding the activity series helps predict corrosion, metal extraction, and reactivity in industrial processes, making it essential for chemistry-related industries. Can I complete the POGIL activity series activity without prior knowledge of reactivity series? While prior knowledge helps, the activity is designed to guide students through the process of discovering the reactivity series through experimentation and guided inquiry. What should I do if I get stuck on the POGIL activity series question? Review the experimental data, revisit the activity instructions, collaborate with classmates, or consult your teacher for hints to help clarify the concepts and move forward.

Related keywords: activity series, pogil worksheet, reactivity series, metal reactivity, pogil activities, activity series chart, metal reactivity order, chemistry pogil, activity series answers, metal displacement reactions

Read the full article online: POGIL THE ACTIVITY SERIES ANSWERS