

pbs nova treasures of the earth gemstones worksheet answers

PBS NOVA Treasures of the Earth Gemstones Worksheet Answers are a valuable resource for educators and students alike, providing insights into the fascinating world of gemstones and the geological processes that create them. The PBS NOVA series has long been recognized for its commitment to delivering high-quality educational content, and the episode "Treasures of the Earth: Gemstones" is no exception. This article will delve into the key themes of the episode, review the worksheet questions, and provide comprehensive answers to facilitate learning and engagement.

Understanding the PBS NOVA Episode

The PBS NOVA episode "Treasures of the Earth: Gemstones" explores the formation, mining, and market of gemstones. It highlights the intricate processes that turn ordinary minerals into precious stones coveted for their beauty and rarity. The episode also discusses the ethical and environmental implications of gemstone mining, making it a well-rounded educational experience.

The Formation of Gemstones

Gemstones are formed through various geological processes over millions of years. The episode outlines several key methods of gemstone formation, including:

1. **Igneous Processes:** This involves the crystallization of minerals from molten rock (magma). Diamonds, for example, are formed deep within the Earth under high-pressure conditions.
2. **Metamorphic Processes:** This occurs when existing rocks are transformed by heat and pressure. For instance, garnets often form in metamorphic rocks.
3. **Sedimentary Processes:** Some gemstones, like opals, form from the accumulation of minerals in sedimentary environments, often involving water.
4. **Organic Processes:** Pearls and amber are examples of gemstones formed through biological processes. Pearls are created by mollusks in response to irritants, while amber originates from tree resin.

Mining and Ethical Considerations

The episode also addresses the methods used to mine gemstones, including:

- **Open-pit mining:** This method is used for larger deposits and can have significant environmental impacts.

- Alluvial mining: This involves searching riverbeds for gemstones and is often less damaging to the environment.
- Underground mining: This is used for deeper deposits and can be more dangerous for miners.

The ethical implications of gemstone mining are a critical topic in the episode. Issues such as child labor, environmental degradation, and the impact on local communities are highlighted, prompting discussions on responsible sourcing and sustainable practices.

Worksheet Overview

The PBS NOVA "Treasures of the Earth: Gemstones" worksheet typically contains a series of questions designed to test comprehension and encourage critical thinking. The questions usually cover the main themes of the episode, including gemstone formation, mining methods, and ethical considerations.

Types of Questions

The worksheet may include various types of questions:

- Multiple Choice Questions: These assess basic understanding of key concepts.
- Short Answer Questions: These require students to elaborate on specific topics.
- Discussion Questions: These prompt deeper thinking and class discussions.

Worksheet Answers

Below is a compilation of answers to common worksheet questions based on the "Treasures of the Earth: Gemstones" episode.

Sample Questions and Answers

1. What are the primary processes through which gemstones are formed?

- Igneous processes
- Metamorphic processes
- Sedimentary processes
- Organic processes

2. Explain how diamonds are formed.

Diamonds form deep within the Earth's mantle under extreme pressure and temperature conditions. Carbon atoms bond in a crystal structure, creating the hardness and brilliance characteristic of diamonds.

3. What is alluvial mining, and how does it differ from open-pit mining?

Alluvial mining involves extracting gemstones from riverbeds and streambeds. It is typically less invasive to the environment compared to open-pit mining, which involves removing large quantities of earth to access deposits.

4. Discuss the ethical implications of gemstone mining.

Gemstone mining can lead to serious ethical issues, including the exploitation of workers, particularly in regions where child labor is prevalent. Additionally, mining can result in environmental degradation and displacement of local communities. Consumers are increasingly encouraged to seek ethically sourced gemstones.

5. What role do gemstones play in culture and society?

Gemstones have significant cultural and economic value. They are often associated with wealth and status and are commonly used in jewelry and decoration. Many cultures attribute spiritual or healing properties to different gemstones, enhancing their significance beyond mere aesthetics.

Engaging with the Material

To get the most out of the PBS NOVA "Treasures of the Earth: Gemstones" episode and related worksheet, students can engage in various activities:

Classroom Discussions

Encouraging open discussions about the ethical implications of gemstone sourcing can foster critical thinking. Students can debate the merits of purchasing ethically sourced gems versus traditional methods, exploring the impact of their choices.

Research Projects

Students can delve deeper into specific gemstones or mining practices. For example, they might research the history of diamond mining in South Africa or the environmental impacts of mining in Brazil.

Field Trips

If possible, organizing a visit to a local museum or gem show can provide a tangible connection to the material covered in the episode. Observing gemstones up close and learning from experts can greatly enhance understanding.

Conclusion

The PBS NOVA "Treasures of the Earth: Gemstones" episode, along with its associated worksheet, offers a comprehensive look into the world of gemstones. By understanding the formation, mining, and ethical considerations surrounding these treasures, students can gain a broader perspective on their value and significance. The answers provided in this article serve as a guide to help educators facilitate discussions and enhance learning experiences related to this captivating topic. Through engaging activities and thoughtful exploration, students can appreciate not only the beauty of gemstones but also the complex realities behind their existence.

Frequently Asked Questions

What is the main focus of the PBS Nova episode 'Treasures of the Earth: Gemstones'?

The episode focuses on the geological processes that create gemstones, their historical significance, and the cultural impact they have had throughout human history.

What are some common methods used to extract gemstones as mentioned in the worksheet?

Common methods include open-pit mining, underground mining, and alluvial mining, which involves extracting gems from riverbeds and stream beds.

How do gemstones form according to the PBS Nova documentary?

Gemstones form under high pressure and temperature conditions deep within the Earth, where minerals crystallize over millions of years.

What role do gemstones play in various cultures as explored in the worksheet?

Gemstones are often used in jewelry, are symbols of wealth and power, and hold spiritual significance in many cultures, being used in rituals and as talismans.

What are some environmental impacts of gemstone mining discussed in the episode?

The episode highlights issues such as habitat destruction, pollution of water sources, and the social implications for local communities affected by mining activities.

Can you name a few gemstones featured in the PBS Nova episode?

The episode features various gemstones, including diamonds, rubies, sapphires, emeralds, and opals.

What are the distinguishing characteristics of gemstones that are highlighted in the worksheet?

The characteristics include hardness, color, clarity, cut, and carat weight, which determine the value and desirability of gemstones.

What is the significance of synthetic gemstones as presented in the documentary?

The documentary discusses how synthetic gemstones are created in laboratories and how they offer alternatives to natural stones, impacting the gemstone market and ethical considerations.

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