

MINERAL EXPLORERS

Brazil



Brazil

The Estrada Real

This episode finds Thomas traveling the famed Estrada Real, or “Royal Road,” exploring Brazil’s rich diamond and gold history. En route, he also discovers the odd formations at Chapada Diamantina National Park and the highly-coveted imperial topaz, found exclusively in Brazil. Along the way, we meet the “Laser Cowboys” who dig for long, beautiful laser quartz crystals, and one of Brazil’s best-known mineral collectors who invites Thomas to view his extensive, private collection

The Center for Gemstones

This journey takes us both above and below eastern Brazil as Thomas explores Governador Valadares, the center for minerals in Brazil, as well as one of the world’s best places for paragliding. Famed for its gemstones, we see how Brazil’s minerals are cut, polished, and prepared for market. Thomas travels to local mines to find gems in their natural, but equally beautiful form, visits the renowned Pederneira tourmaline mine, and an aquamarine mine where he explores a newly found gem pocket as it’s being uncovered.



MINERAL
EXPLORERS
Educator's Guide

DISCOVER BRAZIL

GEOGRAPHY

The Country

Brazil is the largest country in South America and the fifth largest in the world. It shares a border with every South American country except Chile and Ecuador. Brazil gained its independence in 1822 - after 300 years of Portuguese rule - and today it has grown to be South America's economic leader. In addition to its wealth of minerals, the country is also home to over 200 million people and several natural wonders such as the Amazon River and Iguazu Falls.

Population:

202,656,788 (6th in the world)

Prominent Cities:

Brasília (Capital): (pop. of 3.8 million)

São Paulo (pop. of 19.9 million)

Rio de Janeiro (pop. of 11.8 million)

Language:

Portuguese

Government:

Federal republic

Agriculture:

Coffee, soybeans, wheat, rice, corn, sugarcane, cocoa, citrus, and beef

Industry:

Textiles, shoes, chemicals, cement, lumber, iron ore, tin, steel, aircraft, motor vehicles, and machinery


Minerals:

Bauxite, gold, iron ore, nickel, manganese, phosphates, platinum, and tin



Iguazu Falls

Minas Gerais



The Brazilian state of Minas Gerais ("general mines") was first settled by explorers in search of gold and precious minerals in the sixteenth century. This region has supplied over half of the mineral production of Brazil and is well known for its aquamarine, amethyst, tourmaline, topaz, quartz crystal, and diamonds. In the 1700s, these precious stones provided wealth for the Portuguese crown and the beautification of places such as Ouro Preto.

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HISTORY

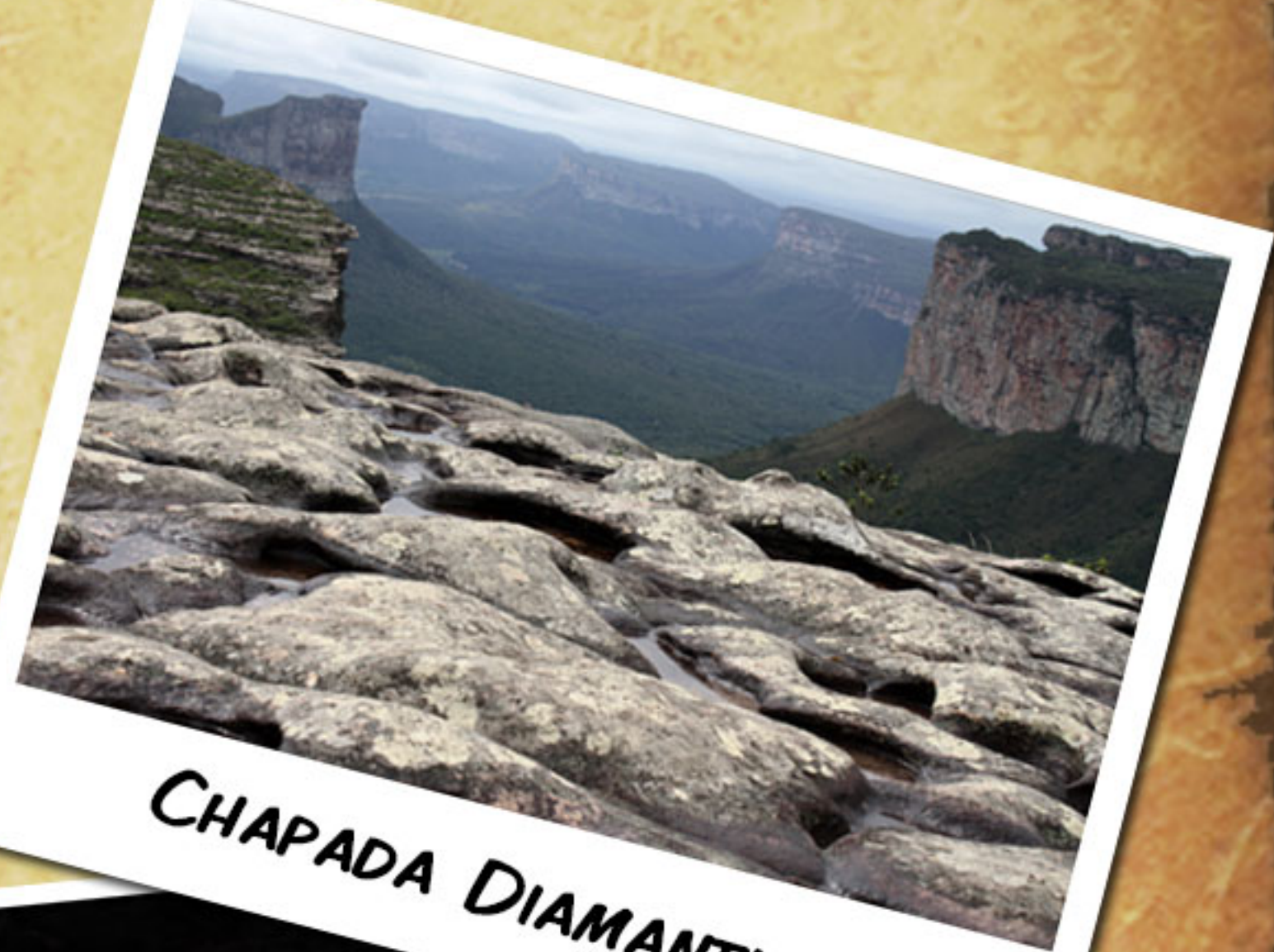
The Estrada Real



The Estrada Real, or the Royal Road, was built by the Portuguese rulers to transport and tax valuable minerals from the mines of Minas Gerais. This historic route carried these minerals to sea port cities such as Rio de Janeiro, where they were then shipped to Portugal. In order to finance its empire, the Portuguese kept the route heavily regulated. Since its origin in 1697, the Estrada Real was primarily used for the mining and transport of gold, but in 1725, diamonds were discovered in Diamantina and the route was expanded in order to secure the newfound treasure. The efficiency of the Estrada Real led to the depletion of gold and diamond production by the 1880s, but many more minerals and sites can be found along its path today.

CAN YOU DIG IT?

Today, the Estrada Real is still a well-known route. Just like Thomas, other adventurers can see the minerals, landscapes, and architecture as they travel the Estrada Real.



CHAPADA DIAMANTINA



TORRINHA CAVE



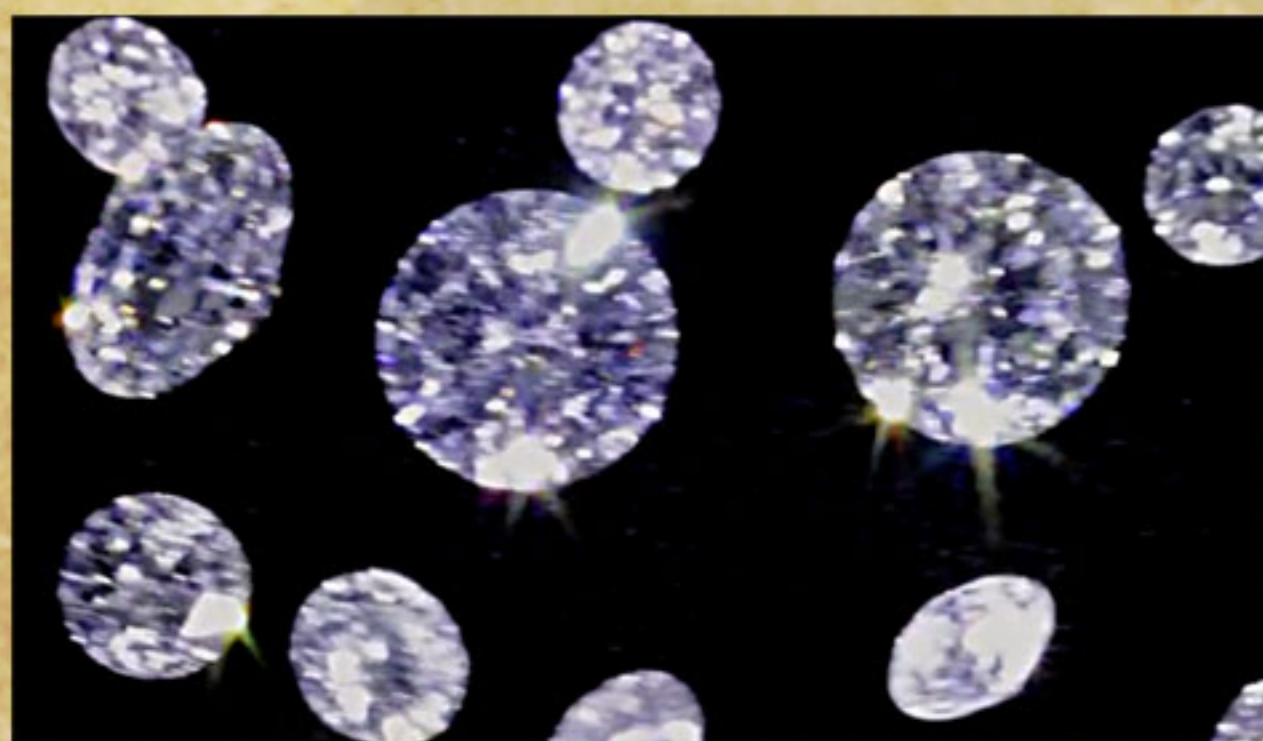
BAROQUE ARCHITECTURE

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DIAMONDS

Brazilian Diamonds

Diamond



Scientific Formula: Carbon

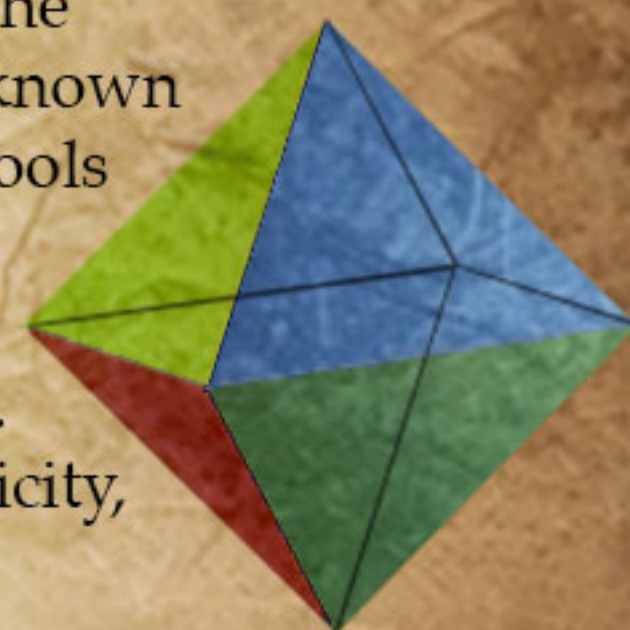
Color: Colorless, yellow, gray, green, and black

Mohs Hardness: 10 (The hardest mineral)

Cleavage: Displays perfect cleavage parallel to the crystal faces

Uses: Famous as gemstones, but also used for high-quality cutting and drilling

The diamond is typically called the most precious of all minerals. Whether the diamond is microscopic or 2,000 carats, every diamond has the above well-known properties. Today, mineral dealers depend on their knowledge and special tools to differentiate between a real diamond and an imitation. There are also a few lesser known facts about diamonds. For one, diamonds are excellent conductors of heat. Unlike cut glass, diamonds are cold to the human touch. Another interesting property is that diamonds are poor conductors of electricity, and become positively charged when rubbed.



Fun Diamond Facts

From 1725 until 1871, some estimate that Brazil exported 1.6 million carats of diamonds. That is about 730 pounds, or the weight of two upright pianos!

In 1896, the automatic diamond sorter was created by understanding a certain property of diamonds: Diamonds and grease stick together very easily. Thus, the diamond sorter was, essentially, a sloped table covered with a thick layer of grease. Miners were able to pour rocks down the table, and everything would pass over, except the diamond.

In 1906, diamonds were discovered in Arkansas. More than 10,000 diamonds have been found in the area, including the largest diamond found in North America at 40.22 carats.



DISCOVER MINERALS

IMPERIAL TOPAZ

Imperial Topaz



Imperial Topaz

Scientific Formula: Aluminum fluoro-hydroxyl-silicate
($\text{Al}_2\text{SiO}_4(\text{F},\text{OH})_2$)

Color: Colorless when pure; cognac, champagne, and peach are favorable

Mohs Hardness: 8

Cleavage: Displays perfect cleavage parallel to the base crystal faces

Luster: Vitreous



BE A ROCKSTAR! MINERAL DEALER TIP:

Imperial Topaz is a unique yellowish-pink topaz variety that only occurs in Ouro Preto, Brazil.

Brazil's Wealth of Minerals



Rutile



Aquamarine



Green Tourmaline



Quartz

Brazil may have depleted much of its diamond and gold production, but, as seen in the series above, there seems to be no end to the variety of other dazzling minerals. Rutile can be a very fragile mineral, but the risk of transporting it is worth the wonder of its unique formation and shimmering, slender crystals. Aquamarine is a blue to blue-green sibling of emerald - both of which fall into the beryl mineral family. The finest tourmalines resemble emeralds, though tourmaline belongs to a different mineral family. In addition to its green hue, tourmaline occurs in many other colors, including pink and blue. Quartz, which is Thomas' favorite mineral, occurs in a variety of sizes and shapes and is abundant in Brazil. The country is rivaled only by Arkansas for having the finest quartz crystals.