Teachers's Guide To Mayan Jungle Adventure

Mayan Jungle Adventure is an interactive fictional story and exploration, with some factual elements. It demonstrates how the multimedia and interactive options available in a computer lesson or story can be utilized to give students an engaging experience not possible with either written material or passively observed media such as television or video alone.

A chance to make choices

The story has eight possible outcomes, with numerous points at which the reader decides which way to go, and therefore influences what happens next. It's an unusual opportunity for students to explore freely, without the pressure of having to choose a correct answer. Paradoxically, this freedom focuses students on being responsible for the results of their choices. They will eagerly repeat the story to see what would happen if they went the other way. I've included a rough flow chart of the activity among the **Teacher Materials**.

Immersion in a realistic experience

Short videos carry the reader from room to room, with appropriate sound effects, to create a convincing illusion of movement through a real environment. In many activities that I write, videos are an added enrichment. That is **not** the case with this story, where many videos are part of the main action of the scene. You'll notice that these videos play automatically when a student

activates a button to indicate a choice of direction or action. Some pages also have optional **Play Movie** buttons, to repeat the movie that has just played.

Similarly, audible speech is usually an extra option, but in this adventure, students should always use the **Speak Text** button on each page. The narrator is a member of the expedition, and there are sound effects along with the speech that help tell the story. There also are sound effects that play automatically, in many systems, as a page opens. Some of these are a part of the plot, and others establish the ambience of the location. Because iPad® does not support autoplay, every page with an ambient sound has a **Play Sound** button, in addition to the **Speak Text** button, to play the background sound. Students using devices that support autoplay may enjoy repeating the sound with these buttons.

Supporting Book: Fact Or Fiction?

In building **Mayan Jungle Adventure**, I used a seamless combination of photos, composite images, imaginary locations (created in Bryce 3D 5.0), nature film clips, and animation to create a vivid and realistic experience. With its combination of factual and fantastic elements, I think it's one of the two best stories I've wtitten... but then I worried that students may not always know which parts are real!

The supporting book **Fact Or Fiction?** attacks this problem. It explains that fiction is imaginary, but differs from a mistake or a lie; then challenges students to guess which specific parts of **Mayan Jungle Adventure** are fact and which are fiction. This is not a graded test, but students do get auditory and visual feedback on each guess.

One of the most important concepts in the story is that something may be partly fact, and partly fiction. When I updated the book nine years after it was written, I added one page, illustrating an example of a lie. Otherwise, I didn't change a thing, because the ideas explored in **Fact Or Fiction?** are more important now, in 2019, than ever before.

I hope this book leads to class discussions about how to evaluate the onslaught of information, some true, some deliberately false, and some mistaken, that is now a part of our lives. In this **Teacher's Guide** to the activity set, I've included background information about the true elements of **Mayan Jungle Adventure** and, possibly more important, the **sources** of that information.

When I wrote **Fact Or Fiction?** in 2010, I had no idea how much more timely the information in it would become, even for young students. Maybe if I wrote it this year, I'd call it Truth Or Consequences. As educators and parents, we all need to know how to determine the veracity of what we pass on to students. That's true of books and other printed material just as much as for the web, but the web may be more intimidating because it's newer and there is just so much of it! Yet avoiding the web means bypassing a wealth of valuable educational material and information, most of it free.

Fact Or Fiction? is a good starting point to understand the question of truth and accuracy (not always identical!). It's never too early to encourage students to know the **source** of what they read, and to note down the sources of what they write. But inevitably, teachers are faced with needing ways to separate the good information from the bad, and knowing where and how to find the good stuff without wasting their limited research time.

For excellent and free resources on how to evaluate information on the web, check out **Education Resources for Web Literacy** at this URL: https://novemberlearning.com/educational-resources-for-educators/web-literacy/ . I've

met Alan November, the founder of this group, and the respect and trust I have for his work is why I've had a link to these resources on his site in the sidebar of Annie's Resource Attic (Info Links/ Information Literacy) from the very start.

Each student can write about a unique adventure

Explorers experience the story as if they really made the journey, rather than simply reading about someone else's exploration. This should inspire vivid and interesting journal writing, with the added element that each student's experience will be unique.

For example, there are two corridors that lead to rooms with two different colossal stone heads. In both cases, the reader stops partway down the hall and must decide whether to continue closer to the stone sculpture, or to turn aside into the jungle. If the reader goes closer to the old man head, the roof collapses. Approaching close to the younger stone head results in being warned off. I wonder if students will be less likely to approach the younger head when they first spy it, if they have already had the roof collapse?

Journal Writing

The multimedia application versions (Classroom Suite, Clicker, HyperStudio) of **Mayan Jungle Adventure** include journals with a gallery of snapshots from the story from which students choose those they want to write about. There are also more guided journals, which I call review, with a photo and question, followed by a writing page. For students with reading and writing limitations, there are journals in which they can construct sentences from banks of complete words.

For those using the online, desktop, PDF, or PowerPoint versions, I've set up PDF format journals that can be used onscreen or printed and used off computer. To accommodate the non-linear structure of the adventure, I made a separate journal that follows the route leading to each of the eight outcomes. Students can write a journal after each

outcome, or you could have them pick their favorite route or routes and write in only one some of the eight journals.

The eight PDF journals each have a number on the cover, corresponding to the following chart. The first four follow the outcomes if you don't go into the tunnel, while the last four lead to outcome if you go inside the ruins.

Journal 1	Blowgun dart	Journal 5	Jaguar
Journal 2	Tamarins	Journal 6	Caiman
Journal 3	Copan head and bats	Journal 7	Snake
Journal 4	Scarlet ibises	Journal 8	Olmec head

Further Discussion

Students can express their feelings about their adventures in their journal writing, but also plan an interesting class discussion after all students have finished the story. For instance, after students have talked about the different experiences each had exploring the same place, invite them to think about how much their past experiences, including what they have read or seen in videos, affects their reactions and actions upon seeing or doing something new.

While the wild adventures in this story are make believe, how might past experiences, or something students have read about or seen in a video, affect their everyday experiences? **To avoid spoilers, be sure everyone has tried out all eight outcomes!**

Comprehension test

There is a short comprehension test (eight three-choice questions) on **Mayan Jungle Adventure**, with photos from the story serving to remind students of a scene or item relating to the question and also

illustrating the answers, with the exception of the last question. The three answer choices for Question 8 are short sentences. The multimedia application versions (Classroom Suite, HyperStudio, and Clicker) include the comprehension test as part of the download.

For 2019, I've added a PDF format comprehension test, which can be worked on the computer or printed out. This test can be used with the online and desktop, PDF, PowerPoint, and My Own Bookshelf versions of the story. There are also older MicroSoft Word versions of the test. In the **Teacher Materials** folder, there is a copy of the comprehension test with answers filled in.

Extensive Audible Glossary

You won't need to encourage students to read **Mayan Jungle Adventure**. In fact, they will eagerly read it repeatedly in order to go through all the possible outcomes. Besides good reading practice, this repetition builds familiarity with the extensive vocabulary in the story. In this way, many of the new words will become a part of the student's everyday vocabulary. A glossary is accessible from every page, and you can download a set of illustrated vocabulary cards.

In 2019, I added audible pronunciation to the online glossary, and the same glossary appears in the desktop version. There also is a stand-alone version of the talking glossary that you can download, which will be helpful to students writing in the PDF format journals. It is written in HTML, and you can open it with any web browser. You don't need an active internet connection to run the **Stand-Alone Glossary**.

If you are using **Mayan Jungle Adventure** in one of the multimedia applications (Classroom Suite, HyperStudio, Clicker) the entire

glossary entry, the word and its definition, will read aloud, using whatever voice is currently set for the system voice of the computer. However, there is great variation in pronunciation with computer text to speech, even between different voices on the same computer. For this reason, I thought it worth while to set up this separate stand-alone glossary to be certain that students hear all these words pronounced correctly.

Vocabulary Cards

Among the materials for download is a PDF with illustrated flashcards for all 28 words in the **Mayan Jungle Adventure Glossary**. There are three to a page, each with a small illustration (photo or full-color drawing) on the left and the word in large print on the right. It's recommended that you print these on card stock or heavier paper. You can download the artwork used on these cards in a separate clip art collection. I've also included a PDF with the glossary words and definitions, for your convenience.

Background information

What follows is extra information about the Olmec and Maya people, and about the animals encountered in the story.

From the Wikipedia article on **Olmec civilization**:

The Olmec civilization developed in the lowlands of southeastern Mexico between 1500 and 400 BC.[3] The Olmec heartland lies on the Gulf Coast of Mexico within the states of Veracruz and Tabasco, an area measuring approximately 275 kilometres (171 mi) east to west and extending about 100 kilometres (62 mi) inland from the coast.[4] The Olmecs are regarded as the first civilization to develop in Mesoamerica and the Olmec heartland is one of six cradles of civilization worldwide, the others being the Norte Chico culture of South America, the Erlitou

culture of China's Yellow River, the Indus Valley Civilization of the Indian subcontinent, the civilization of ancient Egypt in Africa, and the Sumerian civilization of ancient Iraq. Of these, only the Olmec civilization developed in a lowland tropical forest setting.[3]

The Olmecs were the first inhabitants of the Americas to construct monumental architecture and to settle in towns and cities. They were also the first people in the Americas to develop a sophisticated style of stone sculpture.[3] In the first decade of the 21st century evidence emerged of Olmec writing, with the earliest examples of Olmec hieroglyphs dating to around 650 BC. Examples of script have been found on roller stamps and stone artefacts; the texts are short and have been partially deciphered based on their similarity to other Mesoamerican scripts.[5] The evidence of complex society developing in the Olmec heartland has led to the Olmecs being regarded as the "Mother Culture" of Mesoamerica,[3] although this concept remains controversial.[6]

Dating

The colossal heads cannot be precisely dated. However, the San Lorenzo heads were buried by 900 BC, indicating that their period of manufacture and use was earlier still. The heads from Tres Zapotes had been moved from their original context before they were investigated by archaeologists and the heads from La Venta were found partially exposed on the modern ground surface. The period of production of the colossal heads is therefore unknown, as is whether it spanned a century or a millennium.[11] Estimates of the time span during which colossal heads were produced vary from 50 to 200 years.[12] The San Lorenzo heads are believed to be the oldest, and are the most skillfully executed.[13] All of the stone heads have been assigned to the Preclassic period of Mesoamerican chronology, generally to the Early Preclassic (1500–1000 BC), although the two Tres Zapotes heads and the La Cobata Head are attributed to the Middle Preclassic (1000–400 BC).[14]

Characteristics

Olmec colossal heads vary in height from 1.47 to 3.4 metres (4.8 to 11.2 ft) and weigh between 6 and 50 tons.[15] All of the Olmec colossal heads depict mature men with flat noses and fleshy cheeks; the eyes tend to be slightly crossed. The general physical characteristics of the heads are of a type that is still common among people in the Olmec region in modern times. The backs of the heads are often flat, as if the monuments were originally placed against a wall.[1]

All examples of Olmec colossal heads wear distinctive headdresses that probably represent cloth or animal hide originals.[16] Some examples have a tied knot at the back of the head, and some are decorated with feathers. A head from La Venta is decorated with the head of a bird. There are similarities between the headdresses on some of the heads that has led to speculation that specific headdresses may represent different dynasties, or perhaps identify specific rulers. Most of the heads wear large earspools inserted into the ear lobes.[11]

San Lorenzo Colossal Head 1

All of the heads are realistic, unidealised and frank descriptions of the men. It is likely that they were portraits of living (or recently deceased) rulers well known to the sculptors.[11] Each head is distinct and naturalistic, displaying individualised features.[13] They were once thought to represent ballplayers although this theory is no longer widely held; it is possible, however, that they represent rulers equipped for the Mesoamerican ballgame.[11] Facial expressions depicted on the heads vary from stern through placid to smiling.[15] The most naturalistic Olmec art is the earliest, appearing suddenly without surviving antecedents, with a tendency towards more stylised sculpture as time progressed.[17] Some surviving examples of wooden sculpture recovered from El Manatí demonstrate that the Olmecs are

likely to have created many more perishable sculptures than works sculpted from stone.[18]

Although all the colossal heads are broadly similar, there are distinct stylistic differences in their execution.[13] One of the heads from San Lorenzo bears traces of plaster and red paint, suggesting that the heads were originally brightly decorated.[11] Heads did not just represent individual Olmec rulers; they also incorporated the very concept of rulership itself.[21]

The "talking head" in **Mayan Jungle Adventure** is based on the following sculpture:

San Lorenzo Colossal Head 1 (also known as San Lorenzo Monument 1) [46] was lying facing upwards when excavated. The erosion of a path passing on top of the monument uncovered its eye and led to the discovery of the Olmec site. [47] Colossal Head 1 is 2.84 metres (9.3 ft) high;[48] it measures 2.11 metres (6.9 ft) wide and it weighs 25.3 tons. The monument was discovered partially buried at the edge of a gully by Matthew Stirling in 1945. When discovered, it was lying on its back, looking upwards. It was associated with a large number of broken ceramic vessels and figurines.[49] The majority of these ceramic remains have been dated to between 800 and 400 BC;[50] some pieces have been dated to the Villa Alta phase (Late Classic period, 800–1000 AD).[51] The headdress possesses a plain band that is tied at the back of the head. The upper portion of the headdress is decorated with a U-shaped motif.[52] This element descends across the front of the headdress, terminating on the forehead. On the front portion it is

decorated with five semicircular motifs.[53] The scalp piece does not meet the horizontal band, leaving a space between the two pieces. On each side of the face a strap descends from the headdress and passes in front of the ear.[52] The forehead is wrinkled in a frown. The lips are slightly parted without revealing the teeth. The cheeks are pronounced and the ears are particularly well executed.[54] The face is slightly asymmetric, which may be due to error on the part of the sculptors or may accurately reflect the physical features of the portrait's subject.[55] The head has been moved to the Museo de Antropología de Xalapa ("Anthropological Museum of Xalapa").[49]

Source: https://en.wikipedia.org/wiki/Olmec_colossal_heads

More Information: https://www.ancient.eu/Olmec_Civilization/
Has a nice map showing the Olmec cities.

Old Man **Mayan head**
Copán: The Heads of Pauahtun

Pauahtun from the Temple of Inscriptions at Copan
W1095: Pauahtun (West Court)The two Pauahtun heads found at Copán are amongst the most iconic of all the stone carvings and are often referred to as the Old Man of Copan. Age is thought to be indicative of wisdom and it is thought Pauahtun may be an elderly incarnation of the great God Itzamna who created the universe at the beginning of the Mayan era – an era that began in 3114BC and ended in 2012AD. Itzamna was also the God of scribes and knowledge,

and this wise old face would certainly fit within the theory. Pauahtun also frequently wears what appears to be a netted headdress, but may actually be a crocodile skin hat. The purpose of this is unknown.

Pauahtun is also commonly associated with the Bacab who were tasked with holding up the four corners of the universe that Itzaman created. As such, they represented the cardinal points of north, south, east and west. The Bacab were fundamentally important to the Mayan world and were also associated with colours and years. Their names and affiliations are:

Name	Direction	Colour	Year
Cantzinal	North	White	Muluc
Hosanek	South	Yellow	Cauac
Hobnil	East	Red	Kan
Saccimi	West	Black	Ix

Pauahtun in East Court at Copan
W1077: Pauahtun (East Court)Representations of Bakab and Pauatun can be found across the Mayan territories, although sometimes they are also represented by Chac, the God of Rain and Thunder. It is possible that in different years the four "Sky Bearers" or "Year Bearers", as the Bakab are also known, took slightly different forms. Hosanek, for example, is in charge of the year Cauac (Chac) and so it may be that during this year the appearance of the Bacab would reflect whose year it was.

Effigies of the Pauatun or Bacab would often be found holding up the roofs of important buildings – presumably the building was intended to be identified with the earth and its ceiling or roof played the role of the sky and needed to be supported by Bakab. Therefore, these Old Man of Copan may have been two of four heads once mounted on a building somewhere – possibly one of those lost to the Copan River in the early 19th century. However, currently one (fig. W1095) sits in the West Court and the other (fig. W1077) sits in the East Court.

Source: https://uncoveredhistory.com/honduras/copan/copan-the-heads-of-pauahtun/

Scarlet Ibis - *Eudocimus ruber*

This beautifully colored red bird is found throughout Central and South America and is one of the official birds of Trinidad and Tobago. Their long, curved beak is used to probe for crustaceans and insects in the mud and shallow waters. Their color comes from carotene that is found in the crustaceans and will intesify, as they get older. Ibises nest in large breeding colonies in treetops, and both parents contribute to nest building and caring for the young. Two to three eggs are laid each year and the young are ready to leave nest or fledge, 23 days after hatching. The chicks are a dark brownish color that slowly changes to red over the first year's feather molting. Scarlet ibis are long lived and can survive up to 18 years in captivity.

Source: This information was copied from a sign in Moody Rainforest Pyramid, where I photographed the birds.

More Information

Scarlet ibis videos https://search.macaulaylibrary.org/catalog?taxonCode=scaibi&mediaType=v&q=Scarlet%20Ibis%20-%20Eudocimus%20ruber

Phelps, K. 2004. "Eudocimus ruber" (On-line), Animal Diversity Web. Accessed April 17, 2019 at https://animaldiversity.org/accounts/Eudocimus_ruber/

Cotton-Top Tamarin - *Saguinus oedipus*

Cotton-Top Tamarins are small primates that get their name from the puff of white hair on the top of their head that contrasts strikingly with their dark, hairless face. They live high in the trees of the rainforest of South America and eat primarily insects, fruit, and tree gum. Family groups consist of a mated pair that are monogamous and several generations of offspring. The older generations of young help their parents raise their younger siblings and gain experience before becoming parents themselves. A pair of cotton-tops can give birth to two sets of non-identical twins each year, with males being the primary care giver. Despite being very productive, cotton-tops are endangered due to loss of habitat and trapping to supply the illegal pet trade.

Source: This information was copied from a sign in Moody Rainforest Pyramid, where I photographed the animals.

More Information

Cawthon Lang KA. 2005 May 18. Primate Factsheets: Cotton-top tamarin (Saguinus oedipus) Behavior . Printable fact sheet and several recorded calls. http://pin.primate.wisc.edu/factsheets/entry/cotton-top_tamarin/behav

Jaguar - *Panthera onca*

The jaguar (Panthera onca) is a wild cat species and the only extant member of the genus Panthera native to the Americas. The jaguar's present range extends from Southwestern United States and Mexico in North America, across much of Central America, and south to Paraguay and northern Argentina in South America. Though there are single cats now living within the Western United States, the species has largely been extirpated from the United States since the early 20th century. It is listed as Near Threatened on the IUCN Red List; and its numbers are declining. Threats include loss and fragmentation of habitat.

Overall, the jaguar is the largest native cat species of the New World and the third largest in the world. This spotted cat closely resembles the leopard, but is usually larger and sturdier. It ranges across a variety of forested and open terrains, but its preferred habitat is tropical and subtropical moist broadleaf forest, swamps and wooded regions. The jaguar enjoys swimming and is largely a solitary, opportunistic, stalk-and-ambush predator at the top of the food chain. As a keystone species it plays an important role in stabilizing ecosystems and regulating prey populations.

While international trade in jaguars or their body parts is prohibited, the cat is still frequently killed, particularly in conflicts with ranchers and farmers in South America. Although reduced, its range remains large. Given its historical distribution, the jaguar has featured prominently in the mythology of numerous indigenous American

cultures, including those of the Maya and Aztec. **Range map: Red = Current range Pink = Former range**

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Characteristics

The jaguar is a compact and well-muscled animal. It is the largest cat native to the Americas and the third largest in the world, exceeded in size by the tiger and lion.[12][21][22] Its coat is generally a tawny yellow, but ranges to reddish-brown, for most of the body. The ventral areas are white.[23] The fur is covered with rosettes for camouflage in the dappled light of its forest habitat. The spots and their shapes vary between individual jaguars: rosettes may include one or several dots. The spots on the head and neck are generally solid, as are those on the tail, where they may merge to form a band.[12] Forest jaguars are frequently darker and considerably smaller than those in open areas, possibly due to the smaller numbers of large, herbivorous prey in forest areas.[24]

Its size and weight vary considerably: weights are normally in the range of 56–96 kg (123–212 lb). Exceptionally big males have been recorded to weigh as much as 158 kg (348 lb).[25][26] The smallest females weigh about 36 kg (79 lb).[25] Females are typically 10–20 percent smaller than males. The length, from the nose to the base of the tail, varies from 1.12 to 1.85 m (3.7 to 6.1 ft). The tail is the shortest of any big cat, at 45 to 75 cm (18 to 30 in) in length.[25][27] Legs are also short, but thick and powerful, considerably shorter when

compared to a small tiger or lion in a similar weight range. The jaguar stands 63 to 76 cm (25 to 30 in) tall at the shoulders.[23]

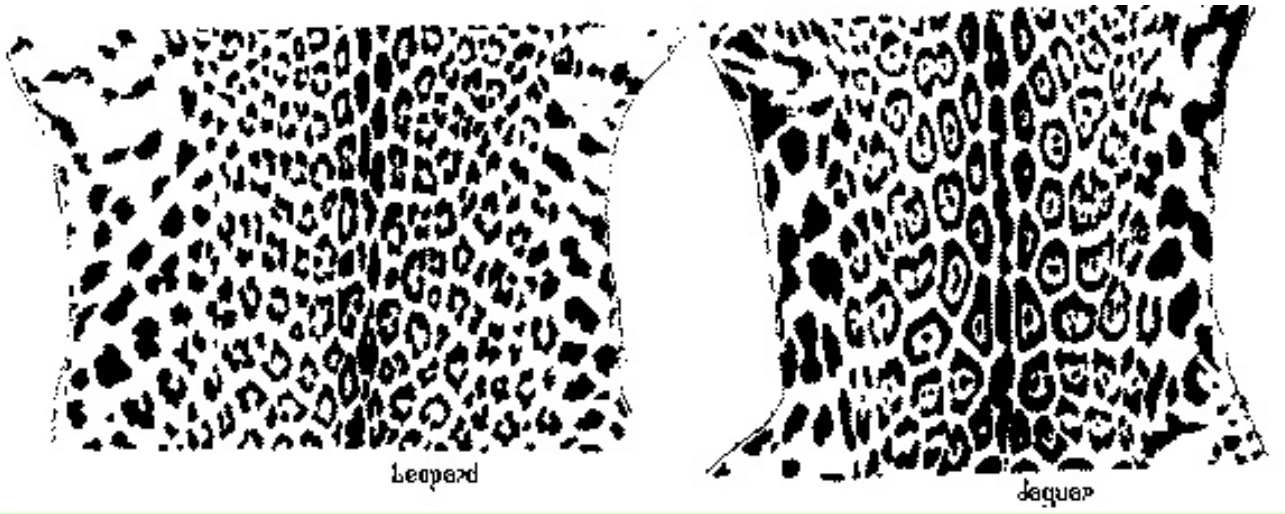
Further variations in size have been observed across regions and habitats, with size tending to increase from north to south. Mexican jaguars in the Chamela-Cuixmala Biosphere Reserve on the Pacific coast weighed just about 50 kg (110 lb), about the size of a female cougar.[28] South American jaguars in Venezuela or Brazil are much larger with average weights of about 95 kg (209 lb) in males and of about 56–78 kg (123–172 lb) in females.[12]

A short and stocky limb structure makes the jaguar adept at climbing, crawling, and swimming.[23] The head is robust and the jaw extremely powerful, it has the third highest bite force of all felids, after the tiger and lion.[29] A 100 kg (220 lb) jaguar can bite with a force of 503.6 kgf (1,110 lbf) at canine teeth and 705.8 kgf (1,556 lbf) at carnassial notch.[30] This allows it to pierce the shells of armored reptiles and turtles.[31] A comparative study of bite force adjusted for body size ranked it as the top field, alongside the clouded leopard and ahead of the tiger and lion.[32] It has been reported that "an individual jaguar can drag an 800 lb (360 kg) bull 25 ft (7.6 m) in its jaws and pulverize the heaviest bones".[33]

While the jaguar closely resembles the leopard, it is generally sturdier and heavier, and the two animals can be distinguished by their rosettes: the rosettes on a jaguar's coat are larger, fewer in number, usually darker, and have thicker lines and small spots in the middle that the leopard lacks. Jaguars also have rounder heads and shorter, stockier limbs compared to leopards.[34]

Colour variation

A melanistic jaguar is a color morph which occurs at about 6 percent frequency in populations. Melanistic jaguars are informally known as black panthers, but as with all forms of polymorphism they do not form a separate species. The black morph is less common than the spotted morph, estimated at occurring in about 6% of the South American jaguar population.[35] In Mexico's Sierra Madre Occidental, the first black jaguar was recorded in 2004.[36]



Leopard coat pattern Jaguar coat pattern

Near Threatened (IUCN 3.1)[1]

At present, the jaguar's range extends from Mexico through Central America to South America, including much of Amazonian Brazil. The countries included in this range are Argentina, Belize, Bolivia, Colombia, Costa Rica (particularly on the Osa Peninsula), Ecuador, French Guiana, Guatemala, Guyana, Honduras, Nicaragua, Panama, Paraguay, Peru, Suriname, the United States and Venezuela. It is now locally extinct in El Salvador and Uruguay.[1]

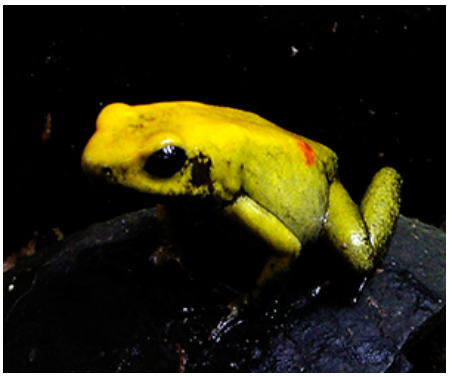
Sources:

Text: https://en.wikipedia.org/wiki/Jaguar

Map: Panthera onca distribution by Shadowfox 2012 (CC BY-SA 3.0) Jaguar (Panthera onca) range. (Key R
Coat Pattern Illustration: https://bigcatrescue.org/jaguar-facts/
Warning: Several erroneous assertions on this page, including a riduculously low number for current population, and an inaccurate meaning for the name jaguar.

More Information
Jaguar information, photos and videos https://eol.org/pages/328606
Bernard DUPONT photostream /jaguars, 5 movies and many excellent photos, both distant and close. https://www.flickr.com/photos/berniedup/with/28108157616/

Bicolor Dart Frog - *Phyllobates bicolor Ruf*



The "yellow poison arrow frog" in the story is one of a group of poisonous treefrogs. There was an extensive collection in the Moody Rainforest pyramid, all different colors and from various parts oif South and Central America. The one in the story is the Bicolor Dart Frog, which lives in western Colombia, and is yellow with darker legs and a characteristic orange spot on his back. He looks like someone touched him with a marker pen! The following information was on two signs in the treefrog exhibit:

Poison dart frogs are tiny, jewel-like frogs that secrete a toxic substance from glands in their skin, Depending on the species, this toxin can cause anything from skin rashes to death in humans. And, it has similar effects on animals, which makes iot useful in capturing food.

Various rainforest tribes of Central and South America coat their blowgun darts with poison. The Choco Indians of Colombia do this by wiping or rolling the tips of their darts aross the backs of poison dart progs. Once the poison has dried on the darts, it stays potent for up to one year and is used top hunt prey such as birds and animals. The poison has an immediate effect, preventing the animal from running too far away and thus making it easier for the hunter to retrieve his prey.

DR. FROG TO THE RESCUE!
Scientists are very interested in the chemicals found in poison dart frog skin. While certain amounts of a toxin may be deadly, smaller amounts may be helpful as medicines. So far, scientits have identified one chemical that is a better painkiller than morphine. Other chemicals from poison dart frogs may be useful as heart medications.

Source: This information was copied from two signs in Moody Rainforest Pyramid, where I photographed the treefrogs.

More Information
Short movie of the Bicolor Dart Frog calling. Phyllobates bicolor Ruf.mp4 by lamasipanguana 2013 Phyllobates bicolor Ruf on YouTube at https://youtu.be/WsQ9FLeVmQE

Vampire Bat - *Desmodus rotundus*

The three species of vampire bats are the only mammals that have evolved to feed exclusively on blood (hematophagy) as micropredators, a strategy within parasitism.[2][3] Hematophagy is uncommon due to the number of challenges to overcome for success: a large volume of liquid

potentially overwhelming the kidneys and bladder,[4] the risk of iron poisoning,[5] and coping with excess protein.[6]

Anatomy and physiology

The common vampire bat, Desmodus rotundus, also has specialized thermoreceptors on its nose,[14] which aid the animal in locating areas where the blood flows close to the skin of its prey. A nucleus has been found in the brain of vampire bats that has a similar position and similar histology to the infrared receptor of infrared-sensing snakes.[15][16]

A vampire bat has front teeth that are specialized for cutting and the back teeth are much smaller than in other bats. The inferior colliculus, the part of the bat's brain that processes sound, is well adapted to detecting the regular breathing sounds of sleeping animals that serve as its main food source.[17][18]

While other bats have almost lost the ability to maneuver on land, vampire bats can walk, jump, and even run by using a unique, bounding gait, in which the forelimbs instead of the hindlimbs are recruited for force production, as the wings are much more powerful than the legs. This ability to run seems to have evolved independently within the bat lineage.[19]

Vampire bats also have a high level of resistance to a group of bloodborne viruses known as endogenous retroviruses, which insert copies of their genetic material into their host's genome.[20]

Vampire bats use infrared radiation to locate blood hotspots on their prey.

Ecology and lifecycle

Vampire bats tend to live in colonies in almost completely dark places, such as caves, old wells, hollow trees, and buildings. They range in

Central to South America and live in arid to humid, tropical and subtropical areas. Vampire bat colony numbers can range from single digits to hundreds in roosting sites. The basic social structure of roosting bats is made of female groups and their offspring, a few adult males, known as "resident males", and a separate group of males, known as "nonresident males".

Feeding

Vampire bats hunt only when it is fully dark. Like fruit-eating bats, and unlike insectivorous and fish-eating bats, they emit only low-energy sound pulses. The common vampire bat feeds primarily on the blood of mammals (occasionally including humans), whereas both the hairy-legged vampire bat and white-winged vampire bat feed primarily on the blood of birds. Once the common vampire bat locates a host, such as a sleeping mammal, it lands and approaches it on the ground. It then likely uses thermoception to identify a warm spot on the skin to bite. They then create a small incision with their teeth and lap up blood from the wound.

If there is fur on the skin of the host, the common vampire bat uses its canine and cheek teeth like a barber's blades to shave away the hairs. The bat's razor-sharp upper incisor teeth then make a 7mm wide and 8mm deep cut. The upper incisors lack enamel, which keeps them permanently razor sharp.[32] Their teeth are so sharp, even handling their skulls in a museum can result in cuts.[33]

The bat's saliva, left in the victim's resulting bite wound, has a key function in feeding from the wound. The saliva contains several compounds that prolong bleeding, such as anticoagulants that inhibit blood clotting,[34] and compounds that prevent the constriction of blood vessels near the wound.

Source: https://en.wikipedia.org/wiki/Vampire_bat

More Information
National Geographic video of vampire bats snacking on a pig. https://assets.nationalgeographic.com/modules-video/stable/assets/ngsEmbeddedVideo.html?guid=2a644ec4-aa66-49b1-b2a1-49d65e55c2ad

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Caiman (several species)

Note: In Mayan Jungle Adventure, the animal in the photo is a caiman, but the animal that swims by in the short video is really a Nile crocodile.
Not to be confused with caiman lizards or blue iguanas, which are sometimes called Grand Cayman iguanas.

Scientific classification
Kingdom: Animalia
Phylum: Chordata
Class: Reptilia
Order: Crocodilia
Family: Alligatoridae
Subfamily: Caimaninae

Description
Caimans inhabit Central and South America from marshes and swamps to mangrove rivers and lakes. Caimans have scaly skin, and live a fairly nocturnal existence.

They are relatively small-sized crocodilians, with an average maximum weight of 6 to 40 kg (13 to 88 lb) depending on species, with the

exception of the black caiman (Melanosuchus niger), which can grow more than 5 m (16 ft) in length and weigh up to 1,100 kg (2,400 lb). The black caiman is the largest caiman species in the world and is found in the slow-moving rivers and lakes that surround the Amazon basin. The smallest species is the Cuvier's dwarf caiman (Paleosuchus palpebrosus), which grows to 1.2 to 1.5 m (3.9 to 4.9 ft) long. There are six different species of caiman found throughout the watery, jungle habitats of Central and Southern America. The average length for most of the other caiman species is about 2 to 2.5 m (6.6 to 8.2 ft) long.

Caimans are distinguished from alligators, their closest relatives, by a few defining features: a lack of a bony septum between the nostrils, ventral armour composed of overlapping bony scutes formed from two parts united by a suture, and relatively longer, more slender, teeth than those possessed by alligators. The calcium rivets on its scales make their hides stiffer, and thus less valuable, than those of alligators and crocodiles, both of which have a similar appearance but are more pliable.[1] Several extinct forms are known, including Purussaurus, a giant Miocene genus that grew to 12 m (39 ft) and the equally large Mourasuchus, which had a wide duck-like snout.[2]

Behaviour

The caimans are predators and, like the alligators and the crocodiles, their diet consists of a great deal of fish. The caimans also hunt insects, birds and small mammals and reptiles.

Due to the large size and ferocious nature of the caimans, they have few natural predators within their environments. Humans are the main predators of the caimans as they have been hunted for their meat and skin. Jaguars and anacondas are the only other predators of the caimans but they prey only on the smaller specimens. During summer or droughts, the caiman may dig a burrow and go into a form of summer hibernation called aestivation.[3]

Female caimans build a large nest in which to lay their eggs, which can be more than 1.5 metres wide. Female caimans lay between 10 and 50 eggs which hatch within about 6 weeks. Once they have hatched, the mother caiman takes her young to a shallow pool of water where they can learn how to hunt and swim.

Source: Wikipedia https://en.wikipedia.org/wiki/Caiman

More Information
National Geographic video about black caimans. I like this short explanation of how wildlife management and conservation efforts also benefit the sport of hunting. https://assets.nationalgeographic.com/modules-video/latest/assets/ngsEmbeddedVideo.html?guid=6bbbc76f-5052-44de-8cfa-af340db86675

Wagler's pit viper or temple viper - *Trimeresurus wagleri*

Description: Green with white cross bands edged with blue or purple. It has two dorsal lines on both sides of its head.

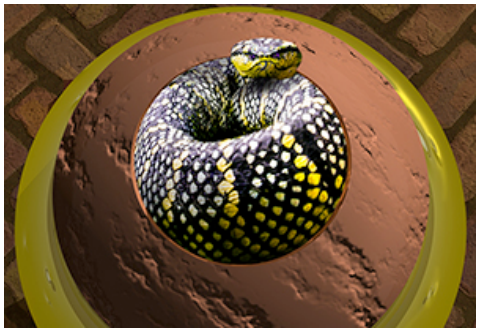
Characteristics: It is also known as the temple viper because certain religious cults have placed venomous snakes in their temples. Bites are not uncommon for the species; fortunately, fatalities are very rare. It has long fangs. Its venom is hemo-toxic causing cell and tissue destruction. It is an arboreal species and its bites often occur on the upper extremities.

Habitat: Dense rain forests, but often found near human settlements.

Length: Average 60 centimeters, maximum 100 centimeters.

Distribution: Malaysian Peninsula and Archipelago, Indonesia, Borneo, the Philippines, and Ryuku Islands.

Source: This information was copied from a sign in Moody Rainforest Pyramid, where I photographed the snake.



Note: I used this viper because I had good photos from my Rainforest Pyramid trip, and because it has striking colors. Also, it does live in temples; just not on the same continent as the Maya civilization. The pot it's coiled inside does not really exist. Like much of the architecture in **Mayan Jungle Adventure**, it was created in Bryce 3D®. The floor you see in the picture is part of a spa in Arizona (the room with a fountain), all combined in PhotoShop®. Yes, I believe in magic!

More information and photos: https://en.wikipedia.org/wiki/Tropidolaemus_wagleri
Short video on YouTube: https://www.youtube.com/embed/hwBt9BjVt1Y

Photo Credits

Photographs by Ann Brundige, except as noted. Photos of scarlet ibis, tamarins, temple viper, yellow poison arrow frog, jaguar skull, and caiman were taken in the Moody Gardens Rainforest Pyramid in Galveston, Texas in 2006. Jaguar (2006) from the Tyler, Texas zoo.

Cabeza_Colosal_nº1_del_Museo_Xalapa.jpg by Locutus Borg 4-6-06 (CC BY-SA 3.0) Olmec head or colossal head labeled as number 1 in the Xalapa's museum of Antropology. It is also known as el rey (the king) It was found in San Lorenzo Tenochtitlán (name of the archeological site, usually shortened to San Lorenzo), located at Texistepec, State of Veracruz, México. It dates from 1200 to 900 years b.C. and is 2.9 meters high and 2.1 meters wide via Wikimedia Commons.

Pauahtun_head,_Copán_(Honduras).jpg by soyignatius (Ismael Alonso) 2007 (uploaded to Commons 2008) (CC BY 2.0) Maya site of Copán (Honduras). Pauahtun head, northeast corner of Structure 10L-11 of the Acropolis, via Wikimedia Commons.

Vampire Bat composite photo: Face from Desmodusrotundus.jpg by Dr. Marco A. R. Mello (Desmodus) 2010 (CC By-SA 3.0) Common vampire bat, and body from VampireBat2010_2.jpg by Ltshears 2010 (CC By-SA 3.0) At the Lousiville Zoo, both via Wikimedia Commons.

Panthera onca distribution by Shadowfox 2012 (CC BY-SA 3.0) Jaguar (Panthera onca) range. (Key Red=Current range Bright pink=Former range)Base map derived from File:BlankMap-Equirectangular.svg. Distribution data from Panthera onca (IUCN Red List) and File:Cypron-Range Panthera onca.svg. via Wikimedia Commons.

Wagler's_pit_viper_(5085453504).jpg by gbohne from Berlin, Germany 9-28-10 (CC BY-SA 2.0) Tropidolaemus wagleri The guide called it "ular bulan" (Bahasa Indonesia for Moon snake). Indonesia, N-Sumatra via Wikimedia Commons.